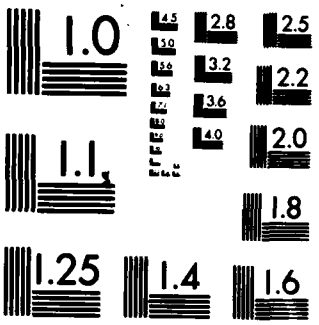
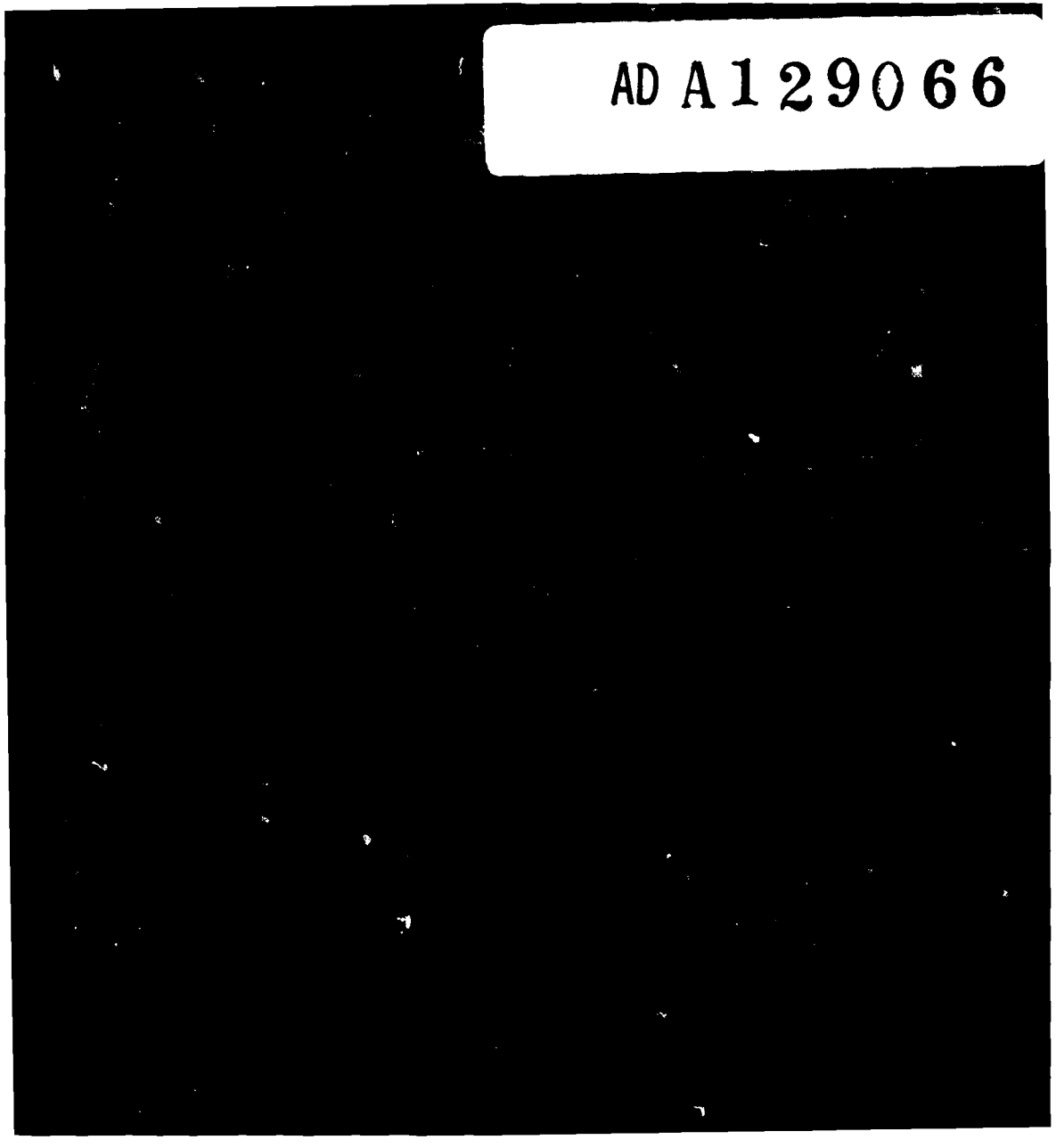
AD-A129 066 STUDY AND INVESTIGATION OF COMPUTER ALGORITHMS FOR THE SOLUTION OF THE SH..(U) CRAMER (H E) CO INC SALT LAKE CITY UT A G TINGLE ET AL. JUL 73 TR-73-302-01-APP 1/2

UNCLASSIFIED DAAD07-72-C-0309 F/G 4/2 NL




AD A129066

DISCLAIMER NOTICE

THIS DOCUMENT IS BEST QUALITY PRACTICABLE. THE COPY FURNISHED TO DTIC CONTAINED A SIGNIFICANT NUMBER OF PAGES WHICH DO NOT REPRODUCE LEGIBLY.

TR-73-302-01

TECHNICAL REPORT

STUDY AND INVESTIGATION OF COMPUTER ALGORITHMS FOR THE SOLUTION OF THE SHALLOW-FLUID EQUATIONS AS A MEANS OF COMPUTING TERRAIN INFLUENCES ON WIND FIELDS

APPENDICES A, B, C AND D

By

Arthur G. Tingle and Jay R. Bjorklund

July 1973

Final Report, Contract No. DAAD07-72-C-0309
With
ASL, ECOM
White Sands Missile Range, New Mexico 88002

H. E. CRAMER COMPANY, INC.
P. O. Box 9249
Salt Lake City, Utah 84109

ABSTRACT

This report describes the development and implementation of a computer algorithm, based on the shallow-fluid equations of oceanography, for calculating the wind field above complex terrain. The algorithm contains a two-dimensional shallow-fluid model in the form of a fully-documented computer program compatible with a UNIVAC 1108 machine. To guide the selection of initialization procedures and the optimum finite-differencing scheme applicable to numerical solutions of the algorithm, a detailed study was made of the analytical solution of the shallow-fluid equations for one-dimensional flows over an isolated ridge. The selected optimum finite-differencing procedure is a Lax-Wendroff scheme using nine grid points and two time levels in combination with a nine-point low-pass filter.

A comprehensive computational program, using an isolated symmetrical mountain, was carried out to provide guidelines as to the nature of two-dimensional solutions of the shallow-fluid equations for the wide variety of initial conditions encountered in the atmosphere. The model was initialized by impulsively accelerating the fluid to a constant velocity everywhere and, after a while, the flow near the mountain approaches a steady state. The results showed that the flow patterns could be divided into four major categories: Subcritical without hydraulic jumps; supercritical without upstream waves; critical with hydraulic jumps and wind-direction reversals; critical with hydraulic jumps but without wind-direction reversals. For the subcritical and supercritical flows, initialization procedures do not appear to pose a problem. For the critical flows, care must be taken in the selection of initialization procedures.

Comparisons of calculated wind field patterns with recent detailed observations of wind circulations above complex terrain show excellent qualitative agreement in the limited cases available for analysis. Additionally, the computer algorithm for the two-dimensional model, when applied to the terrain at White

Sands Missile Range, gave results that were consistent with limited observations available for two example situations.

The computer program containing the two-dimensional shallow-fluid model is written in FORTRAN V language and is fully documented in the four appendices to the report. The documentation includes user's instructions, a complete program listing, detailed flow diagrams, and a completely worked example problem.

FOREWORD

This report has been prepared by the H. E. Cramer Company, Inc. in partial fulfillment of the requirements under Contract No. DAAD07-72-C-0309 with the White Sands Missile Range. The assistance of Dr. Joseph Shinn and Mr. Ernie Stenmark of the Atmospheric Sciences Laboratory, White Sands Missile Range is gratefully acknowledged. Dr. Shinn provided excellent liaison with ASL personnel, while Mr. Stenmark provided technical assistance in adapting the computer program to ASL facilities. The authors wish to acknowledge the considerable benefit derived from numerous discussions of the mathematical properties of the model with their colleague Dr. Brian Lau who is also an Assistant Professor of Mathematics at the University of Utah, Salt Lake City.

TABLE OF CONTENTS

TABLE OF CONTENTS (Continued)

APPENDIX A

USER INSTRUCTIONS FOR THE ASL/WSMR WIND FIELD TERRAIN ADJUSTMENT MODEL COMPUTER PROGRAM

The ASL/WSMR Wind Field Terrain Adjustment Program is designed to adjust the wind speed and direction field to the terrain heights at each coordinate intersection over a reference grid system.

The computer program is written in the FORTRAN V language and is designed for use on a UNIVAC 1108 computer. The program requires 31390_{10} words of core storage including system and FORTRAN library routines. The computer program has the optional capability of printing the adjusted wind speed and direction fields and surface layer heights at specified time intervals. In addition, the wind fields and layer height information may be written on magnetic tape for subsequent graphical processing. The program uses FORTRAN Logical Tape 5 (Card Reader) and Logical Tape 6 (Printer) for standard input/output. The program also uses Logical Tape 1 as a file for optional output. The computer program construction is described in Section A. 1 and user instructions are given in Sections A. 2, A. 3 and A. 4. An example problem is given in Section A. 6 and a program listing is shown in Appendix B.

A. 1 COMPUTER PROGRAM CONSTRUCT

The Wind Field Terrain Adjustment Model Program consists of six subroutines including the main driver program MODEL. Program MODEL determines the number of problem cases to be executed in a single computer run and determines the core allocation of variable program arrays for each problem. The computer program uses object time-dimensioning techniques to accommodate different grid system sizes. The grid system is assumed to be the first quadrant of a Cartesian coordinate system with the positive y-axis oriented north and the positive x-axis

oriented east. The total size of the grid system matrix is limited by the equation:

$$N \geq 7*IDIM*JDIM+2*IDIM+2*JDIM$$

The parameter IDIM is the maximum size of the x dimension and JDIM is the maximum size of the y dimension of the grid system matrix. The parameter N is the DIMENSION'd size of a large array Q in MODEL containing all program variable arrays that depend on the grid system matrix. The parameter N is currently set to 18000, but it can be set to any value in order to accommodate the program to computer core storage limitations.

The first subroutine, Subroutine JACK, is the main calculation routine. This subroutine inputs the model data, determines the program options desired, sets the initial wind field conditions and then enters a time loop through the shallow-water model equations discussed in Section 4 of the main body of the report. The computer program uses a second-order central space and forward time differencing scheme to evaluate Equations (4-14) through (4-21). The wind speed and direction or the u and v components of the wind speed, as well as the surface layer heights, are printed and/or written to tape at selected points in the time loop. When the time loop is completed, the program stops or loops to the next problem in sequence.

The remaining subroutines are utility support programs for Subroutine JACK. Subroutine MISC determines the area of uniform grid spacing within the grid system and returns the indices of this area for tape output. Subroutine UVDIR converts the u and v components of the wind speed to wind speed and direction for printing. Subroutine MOUTNR inputs the terrain data into a specified area of the grid system. The program fills any remaining area of the grid with height values calculated from the minimum height and the height at the edge of the input area as a function of distance. Subroutine OUTPT is the tape output routine and uses the UNIVAC NTRAN routines.

A logic diagram of the computer program is given in Section A.5 and detailed flow charts of the computer program are given in Appendix D.

A.2 PROGRAM INPUT PARAMETERS

The data input parameters required for the computer program are listed in Table A-1. The information categories in the table are defined as follows:

CARD GROUP SEQUENCE NUMBER - Order of input of the three card groups.

NAMELIST - Name of the FORTRAN NAMELIST list to which the input parameters belong (Card Group 2 only).

FORTRAN - FORTRAN symbolic notation defining the program input.

MODEL - Mathematical notation corresponding to the FORTRAN notation.

UNITS - Dimensional units of the input parameters.

LIMITS - Numerical limits on input parameters.

VALUE - Default value substituted if the present value is zero (Card Group 2 only).

ARRAY SIZE - Maximum number of core locations reserved for the parameter.

CARD COLUMNS - Data card punch field.

FORMAT - FORTRAN input format.

TABLE A-1

PROGRAM INPUT PARAMETERS

Card Group Sequence Number	Namelist	FORTRAN	Model	Units	Limits	Value ②	Array Size (words)	Card Columns	Format
1	N/A	ND	N/A	N/A	N/A	N/A	1	1-2	I2
		NP	N/A	N/A	N/A	N/A	1	1-2	I2
		IDIM	N/A	N/A	≤ 80 ①	N/A	1	3-5	I3
		JDIM	N/A	N/A	≤ 80 ①	N/A	1	6-8	I3
2	QLST1	LL	N/A	N/A	≤ IDIM	IDIM ④	1	③	N/A
		JL	N/A	N/A	≤ JDIM	JDIM ④	1	③	N/A
		X	x	Meters	≥ 0.0	④	80	③	N/A
		Y	y	Meters	≥ 0.0	④	80	③	N/A
		ISKIP	N/A	N/A	⑤	⑤	10	③	N/A
		ABLK	N/A	Meters	≥ 0.0	50.0	1	③	N/A
		PRINT	N/A	Minutes	> 0.0	N/A	20	③	N/A
		ULT	u or $\bar{u}$	Meters sec^{-1}	N/A	N/A	1	③	N/A
		VLT	v or D	Meters sec^{-1} or Degrees	If D then $0.0 \leq D \leq 360.0$	N/A	1	③	N/A
		PLT	ϕ	Meters	≥ 0.0	N/A	1	③	N/A
		DTLMDA	λ	N/A	$0 < DTLMDA < 1$	0.95	1	③	N/A

TABLE A-1 (Continued)

Card Group Sequence Number	Namelist	FORTRAN	Model	Units	Limits	Value ②	Array Size (words)	Card Columns	Format
2	QLST1 (Cont.)	G1	g'	Meters sec^{-2}	$0 < G1 < 9.8$	0.1	1	③	N/A
		ISMOTH	N/A	N/A	≥ 0	10	1	③	N/A
		NCNT	N/A	N/A	≥ 0	2	1	③	N/A
		IUNIT	N/A	N/A	> 0	1	1	③	N/A
3 ⑦	N/A	IST	N/A	N/A	$1 \leq IST < LL$	N/A	1	1-4	I4
		IND	N/A	N/A	$1 < IND \leq LL$	N/A	1	5-8	I4
		JST	N/A	N/A	$1 \leq JST < JL$	N/A	1	9-12	I4
		JND	N/A	N/A	$1 < JND \leq JL$	N/A	1	13-16	I4
		HG	H	Meters	≥ 0.0	N/A	IDIM* JDIM	15-74	14x, 10 F6.1 ⑥

① The parameters IDIM and JDIM are limited by the equation N = (7*(IDIM*JDIM)+2*IDIM+2*JDIM) where N is less than or equal to the dimension of the variable Q in the main program MODEL. The dimension of Q in the program shown in Appendix B is 18000. Also, if IDIM or JDIM is set greater than 80, the dimension of x or y in subroutine JACK must be increased to the new value.

② The value column indicates which parameters have default values should they be set to zero. All parameters with an N/A in this column must have values specified on input.

③ All namelist input parameters must leave column one blank. See Section A.3.

TABLE A-1 (Continued)

④ The default values for LL and JL are IDIM and JDIM except when X(2) and Y(2) are zero. When X(2) and Y(2) are zero, LL and JL are both set to 41 and the X and Y arrays are automatically filled with the UTM coordinates of the standard WSMR terrain elevation data shown in Section A. 6. Also, when X(2) and Y(2) are set to zero, IDIM and JDIM must have values greater than or equal to 41. The UTM default coordinates in kilometers are:

X = 100, 180, 260, 300, 320, 330, 335, 340, ····, 470, 475, 480, 490, 510, 550, 630, 710

Y = 3340, 3420, 3500, 3540, 3560, 3570, 3575, 3580, 3585, ····, 3700, 3705, 3710, 3715, 3720, 3730, 3750, 3790, 3870, 3950

where the center of each axis is in 5-kilometer increments.

⑤ See Section A. 4. 2 for the allowable ISKIP values.

⑥ See Section A. 4. 3 for the input statements used to read the terrain elevation data.

⑦ Card Group No. 3 is read only if ISKIP(5) is zero.

A.3 DATA INPUT METHOD

This computer program uses formatted as well as namelist input statements. The parameters using a formatted read statement are self explained in Table A-1. The namelist input data must be in a specific form in order to be read using a NAMELIST list. The first character in each card to be read must be blank. The first card in the namelist list contains the namelist name preceded by the character $. The last card in each namelist list contains $END to terminate the list. The form of the remaining data items in the list may be:

a. *Variable Name = Constant* - The *variable name* may be a subscripted array name or a single variable name. Subscripts must be integer constants. The *constant* may be integer or real.

b. *Array Name = Set of Constants* (Separated by Commas) - The *array name* is not subscripted. The *set of constants* consists of constants of the type real or integer. The number of constants must be less than or equal to the array size. Successive occurrences of the same constant can be represented in the form *k* constant*.

The sequence of the input data parameters within the list is not significant. A more detailed explanation of the FORTRAN NAMELIST can be found in any Fortran Language Manual. The input parameters within the namelist that have default values in Table A-1 are initialized to zero prior to input of the first case. Parameters that are not used or have default values need not appear in the namelist list. When multiple cases are stacked, all parameters retain their values from the previous case and are changed only by input.

A.4 EXPLANATION OF PROGRAM INPUTS

The program input parameters are arranged into four card groups.

A.4.1 Card Group Number 1

This card group contains information specifying the number of cases to be executed and the size of program storage arrays.

ND - Number of times to loop through the entire program reading a new set of values for NP, IDIM and JDIM on each loop.

NP - Number of times to loop through the main calculation routine using constant values of IDIM and JDIM and reading Card Group 2 (also Card Group 3 if requested) on each loop.

IDIM - Maximum number of grid coordinates in the x direction for all cases within the NP loop.

JDIM - Maximum number of grid coordinates in the y direction for all cases within the NP loop.

(IDIM and JDIM are used to determine the size of program storage arrays at execution time. See Table A-1 for the limits on these parameters.)

A.4.2 Card Group Number 2

This data card group contains most of the program input data. The data parameters in this group are read using the Fortran Namelist QLST1 to simplify program input and reduce the number of input cards for similar cases stacked in sequence. Table A-1 gives default values for applicable parameters in

this card group. Also, all parameters in this card group retain the value set by the previous case unless changed by input.

LL - Number of grid coordinates in the x direction for the present case.

JL - Number of grid coordinates in the y direction for the present case.

X - Array containing the coordinates of the x-axis of the grid system in ascending order.

Y - Array containing the coordinates of the y-axis of the grid system in ascending order. See Table A-1 for default values for x and y.

ISKIP - Program option control flag. All ISKIP options are assumed initially zero.

a. If ISKIP(1) is set to 1, the calculated wind field and layer height values are printed at each time given in the array PRINT below.

b. If ISKIP(2) is set to 1, the wind field and layer height arrays are output to tape at each time given in the array PRINT. If ISKIP(1) and ISKIP(2) are both zero, then ISKIP(2) is set to 1.

c. If ISKIP(3) is set to 1, the terrain height matrix is output to tape (ISKIP(2) must equal 1 also).

d. If ISKIP(4) is set to zero, the program assumes ULT and VLT below are input as the initial u and v components of the wind speed and the adjusted u and v components are printed in the wind field output print file.

If ISKIP(4) is set to 1, the program assumes ULT and VLT are input as the initial u and v components of the wind speed and the adjusted wind speed and direction are printed in the wind field output print file.

If ISKIP(4) is set to 2, ULT and VLT are assumed to be the initial wind speed and direction and the adjusted u and v components of the wind speed are printed in the wind field output print file.

If ISKIP(4) is set to 3, ULT and VLT are assumed to be the initial wind speed and direction and the adjusted wind speed and direction are printed in the wind field output print file.

e. If ISKIP(5) is set to 0, the terrain height matrix is input in Card Group Number 3.

If ISKIP(5) is set to 1, the terrain height matrix used in the last executed case is used in the present case.

ABLK - Minimum layer depth. If the layer depth is found to be less than ABLK in any iteration, the layer depth is then set to ABLK. A value of 50 meters is assumed if zero is input.

PRINT - Array containing the iterative time step value in minutes at which the wind field and layer height values are to be printed and/or output to tape. Values are arranged in ascending order.

ULT - The initial u component of the wind speed if ISKIP(4) is set to 0 or 1. The initial mean wind speed if ISKIP(4) is set to 2 or 3.

VLT - The initial v component of the wind speed if ISKIP(4) is set to 0 or 1. The initial direction if ISKIP(4) is set to 2 or 3.

PLT - The initial surface layer height.

DTLMDA - Stability factor used in calculating the time step DT. This value should be as close to 1 as possible. The program assumes a general value of 0.95 if zero is input. Program instability is indicated by a program message IFLAG ERROR. When this occurs, either the value of DTLMDA or NCNT must be reduced.

G1 - Reduced gravity factor, where $G1 = g\left(1 - \frac{\rho_1}{\rho_0}\right) \simeq g\left(1 - \frac{\theta_0}{\theta_1}\right)$

g = the acceleration of gravity

θ_1 = the potential temperature at the top of the surface layer

θ_0 = the potential temperature at the bottom of the surface layer

ρ_1, ρ_0 = respective layer densities

The program assumes a value of 0.1 for G1 if zero is input.

ISMOTH - The number of time steps between the application of a nine-point filter to the adjusted values of the wind field. A value of 10 is assumed if zero is input. If no smoothing is desired, set ISMOTH to a large value, say, 10,000.

NCNT - The number of time steps between the recalculation of the time step time increment DT. A value of 2 is assumed if zero is input.

IUNIT - The Fortran logical output unit for tape output. The program uses NTRAN I/O with unit 0 an illegal unit. The program assumes unit 1 if zero is input. If more than one reel of output is executed, a second reel must be assigned to IUNIT + 1. See Section A.7 for the output tape format.

A.4.3 Card Group No. 3

This card group contains the terrain heights and the starting and ending indices that define the area of storage of the terrain heights within the grid system. The terrain heights outside of the input areaaare calculated from the

minimum height and the height on the edge of the input terrain. The starting and ending indices of the x and y axes are input first, followed by the terrain heights.

IST - Starting index of the terrain height matrix in the x direction.

IND - Ending index of the terrain height matrix in the x direction.

JST - Starting index of the terrain height matrix in the y direction.

JND - Ending index of the terrain height matrix in the y direction.

HG - The matrix of terrain heights input by the following Fortran statements:

```
      DO 10 J = JST, JND
   10 READ (5, 2000) (HG(I, J), I=IST, IND)
 2000 FORMAT (14X, 10F6. 1)
```

A.5 SUBROUTINE LINKAGE FOR THE COMPUTER PROGRAM

The logical linkage for the computer program subroutines is shown in Figure A-1. Each connector represents a communication link between the subroutines.

A.6 EXAMPLE COMPUTER PROGRAM

This section explains the input data example shown in Figure A-2. The example consists of a problem with WSMR terrain elevation data. The example data shown here is a computer listing of the data. The data are stored in a program file as an element of the file.

The first card image shown is a system (@MAP, I) card starting in column one. This card is used to direct the system to link the program subroutines and form an absolute program deck. The second card image @XQT directs the system to load and execute the program using the data that follow.

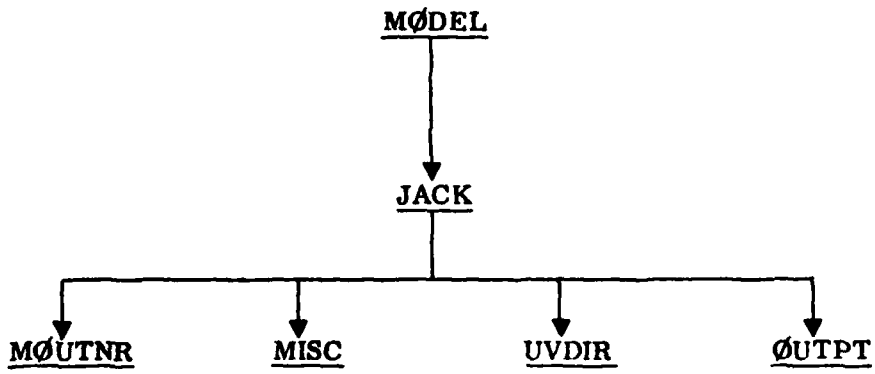


FIGURE A-1. Diagram of linkage between subroutines of the computer program.

```
@ELT,I.L DATA
ELT 003-06/07-14:03
000   @MAP,I
000   @XQT
000   1
000   1 41 41
000   SOLST1
000   ISKIP=1,1,1,1,0
000   PRINT=180,300,
000   ULT=7,
000   VLT=7,
000   PLT=2000,
000   ISMOTH=5,
000   IUNIT=1,
000   $END
000     6   36    6   36
000                      1194,81197.91255.81341.11645.92133.51347.21249.71204.01219.2
000                      1234,41243.61246.61258.81319.81338.11396.01411.21655.11588.0
000                      1524,01493.51463.01444.81414.31432.61383.81304.51453.91432.6
000                      1277.1
000                      1188,71216.21493.51402.11706.92255.51402.11237.51219.21222.3
000                      1237,51243.61246.61249.71280.21286.31335.01438.71603.31594.1
000                      1533,11524.01487.41420.41365.51325.91310.61402.11463.01341.1
000                      1274.1
000                      1188,71288.21341.11444.81786.92438.41463.01219.21341.11200.9
000                      1234,41240.51246.61249.71249.71268.81335.01432.61585.01606.3
000                      1524,01505.71487.41463.81359.41316.71371.61597.21438.71432.6
000                      1402.1
000                      1219,21298.51347.21408.21786.91463.01316.71228.31287.01222.3
000                      1231,41237.51249.71341.11283.21258.81292.41482.11824.61529.0
000                      1463,01450.91469.11453.91420.41386.81645.91563.01824.01539.2
000                      1463.0
000                      1341,11359.41328.91399.01548.41600.21389.91219.21204.01225.3
000                      1216,21225.31249.71524.01280.21255.81255.81341.11645.91478.3
000                      1493,51524.01517.91527.11493.51767.81706.91536.21645.91706.9
000                      1493.5
000                      1463,01341.11328.91383.81527.12133.61524.01258.81207.01213.1
000                      1216,21222.31234.41402.11264.91225.31246.61310.61402.11545.3
000                      1548,41645.91328.91633.71905.01828.81706.91652.01737.41828.8
000                      1524.0
000                      1353,31325.91328.91389.91505.71828.81706.91341.11213.11213.1
000                      1213,11219.21222.31237.51228.31228.31243.61304.51432.61706.9
000                      1828,81828.81641.01758.71898.92072.61889.81737.41767.81767.8
000                      1585.0
000                      1328,91325.91325.91380.71487.42072.61889.81615.41213.11213.1
000                      1216,21216.21219.21222.31234.41234.41249.71298.51402.11585.0
000                      2072,61950.72011.71950.71935.52042.21859.31828.81816.61950.7
000                      1981.2
000                      1316,71372.81338.11389.91472.21828.81737.41286.31287.01210.1
000                      1210,11216.21222.31225.31225.31222.31285.81301.51420.41828.8
000                      2176,32139.72133.62164.12194.62090.91908.12109.21950.71898.9
000                      1828.8
000                      1335,01335.01350.31414.31530.12255.51371.61219.21207.01219.2
000                      1210,11213.11219.21222.31219.21219.21243.61274.11508.81956.8
000                      2133,62377.42590.82377.42194.62103.12011.71920.21920.21907.5
000                      1828.8
000                      1320,71341.11389.91444.81554.52316.51341.11210.11200.91194.3
```

FIGURE A-2. Computer listing of the example input data.

```
000055   000   1213.11213.11216.21280.21219.21222.31237.51280.22011.72237.2
000057   000   2436.42651.42621.32347.02255.52158.02072.61950.72042.21889.8
000058   000   1737.4
000059   000   1353.31300.71447.81502.71645.91767.81304.51216.21200.91200.9
000060   000   1207.01216.21216.21225.31231.41231.41249.71889.82133.62743.2
000061   000   2662.22743.22499.42499.42255.52103.12072.61981.22011.71889.8
000062   000   1635.5
000063   000   1389.91438.71521.01653.72036.11706.91271.01210.11197.91194.8
000064   000   1207.01216.21219.21234.41243.61246.61264.92072.62286.02880.4
000065   000   2810.32743.22560.32529.82164.12133.62036.12011.72011.71828.8
000066   000   1670.3
000067   000   1400.21463.01527.11645.91615.41645.91231.41185.71200.91194.8
000068   000   1213.11216.21222.31243.61249.71264.91316.71737.42011.72834.6
000069   000   2865.12621.32316.52316.52072.62133.62011.72011.72011.71804.4
000070   000   1981.2
000071   000   1438.71518.31585.01777.01706.91828.81213.11210.11194.81200.9
000072   000   1219.21216.21222.31246.61258.81280.31325.91630.72133.62804.2
000073   000   2662.22531.32560.32499.42301.22063.52103.11920.21950.71737.4
000074   000   1645.9
000075   000   1481.31563.61722.11737.41828.81524.01185.71200.91194.81197.9
000076   000   1213.11216.21231.41258.81280.21316.71371.61767.82072.62225.0
000077   000   2662.22712.72499.42493.32374.42142.72042.21920.21828.81828.8
000078   000   1767.8
000079   000   1524.01609.31706.91737.41767.81255.81185.71191.81185.71194.8
000080   000   1207.01219.21240.51264.91292.41335.01408.21585.01767.82072.6
000081   000   2621.32682.22529.82411.02161.02130.72087.91950.71798.31859.3
000082   000   1959.3
000083   000   1572.81767.81773.91645.91615.41237.51197.91204.01207.01210.1
000084   000   1213.11219.21249.71274.11310.61341.11469.11630.72133.62438.4
000085   000   2560.32468.92438.42243.02218.92072.62255.52011.71749.61889.8
000086   000   1869.8
000087   000   1594.11639.81869.81828.81889.81493.51207.01207.01213.11216.2
000088   000   1158.21234.41249.71280.21325.91380.71499.61645.92255.52194.6
000089   000   2621.32438.42468.92496.32407.92267.72209.81999.51920.21828.8
000090   000   1828.8
000091   000   1642.91310.51767.81767.81767.81289.31216.21207.01216.21222.3
000092   000   1222.31234.31252.71283.21328.91392.91514.91645.92042.22316.5
000093   000   2255.52438.42438.42499.42438.42133.62167.12087.91889.81920.2
000094   000   1807.5
000095   000   1682.51950.71908.11828.81706.91280.21234.41225.31222.31226.3
000096   000   1237.51246.61249.71286.31344.21417.31578.91950.71874.52255.5
000097   000   2104.12497.92484.12529.82286.02237.22103.12042.21920.21886.7
000098   000   1828.8
000099   000   1703.42911.72072.01706.91767.81365.51274.11225.31222.31240.5
000100   000   1952.71204.31200.21304.51344.21441.71645.91767.81889.82072.6
000101   000   2377.42697.32438.42377.42301.22191.52133.62042.21889.81889.8
000102   000   1828.8
000103   000   1706.91376.31950.72011.72240.31524.01371.61252.71237.51252.7
000104   000   1261.91200.21238.51286.31362.51463.01633.72133.61938.52042.2
000105   000   2408.91355.32377.42433.42374.42225.82133.62017.91859.31905.0
000106   000   1347.2
000107   000   1645.91493.41859.31882.71920.22133.62438.41371.61246.61246.6
000108   000   1707.21200.31320.01333.11377.71981.31615.42438.42194.62286.0
000109   000   2377.42500.32072.02103.12438.42011.72011.71950.71889.81761.7
000110   000   1707.3
000111   000   1505.12591.21706.91706.91767.81737.42133.62072.61292.41271.0
000112   000   1203.21374.51324.91308.11411.21502.71606.31737.42194.63230.2
```

FIGURE A-2. (Continued)

```
000113    000    2377,42133,02133,12072,62194,62987,92057,41920,21798,31767,8
000114    000    1524,0
000115    000    1514,91557,51585,01597,21633,71615,41664,21889,81341,11292,4
000116    000    1364,51322,31332,01371,61444,81645,91706,91767,82621,33474,7
000117    000    2641,32682,22225,02148,82133,61767,81920,21889,81767,81804,4
000118    000    1752,6
000119    000    1400,01466,11441,31502,71511,81530,11585,01493,51392,91344,2
000120    000    1332,01341,11347,21527,11466,11706,91828,82011,72439,42621,3
000121    000    2500,32635,52133,62133,62103,11828,81737,41956,91749,61740,4
000122    000    1700,0
000123    000    1463,01441,71429,51432,61450,91469,11959,71767,91472,21402,1
000124    000    1402,11380,71380,71432,61487,41591,11767,61889,82194,62804,2
000125    000    2499,42316,52133,62133,61920,21981,21956,81828,81804,41844,0
000126    000    1798,3
000127    000    1404,41460,01417,31432,61402,11432,61560,62133,61493,51481,3
000128    000    1514,91438,71402,11402,11463,01563,61950,71828,82331,72499,4
000129    000    2316,52133,62133,62072,61935,51950,71829,82072,62030,01889,8
000130    000    1770,9
000131    000    1401,31460,01441,71435,61435,61402,11463,01575,81691,61645,0
000132    000    1645,91407,41460,01453,91460,01527,11585,01664,21807,51935,5
000133    000    1993,41950,72133,02026,91950,72911,72072,62407,82377,42590,8
000134    000    2194,0
000135    000    1453,91456,91447,01441,71432,61420,41450,91539,21691,62042,2
000136    000    1645,91536,21561,91407,41493,51524,01549,41636,81706,91767,8
000137    000    1913,62133,62194,62133,62347,02347,02682,22590,82438,42133,6
000138    000    1829,8
```

FIGURE A-2. (Continued)

The first data card shows a 1 in column two. This value (ND) is the number of times the entire program is to be executed reading a new set of dimension parameters on each pass. The second data card sets NP to 1 and IDIM and JDIM both equal to 41. The parameter NP represents the number of times the program is to be executed using IDIM and JDIM set to 41. All following cards beginning with $QLST1 are repeated NP times. The third data card begins the namelist QLST1. The parameter ISKIP indicates:

(1) The adjusted wind field and layer heights are printed at each time given in the array PRINT

(2) The adjusted wind field and layer heights are output to tape

(3) The terrain heights are output to tape

(4) ULT and VLT are input as vector components and mean wind speed and direction are printed in the output listing

(5) The terrain height data will be input following the namelist QLST1.

The remaining parameters in QLST1 indicate that output is to take place at 180 and 300 seconds iteration time and the u and v components of the wind speed are set to 7 meters per second. Also, the initial surface layer is 2800 meters high and filtering is to be done on each fifth time step and the output unit is Unit 1. Several parameters from QLST1 do not appear in the data because default values are provided. The parameters and values are:

LL=41; JL = 41; X = UTM coordinates of terrain (see Table A-1);

Y = UTM coordinates of terrain (see Table A-1); ABLK = 50 meters;

DTLMDA = 0.95; G1 = 0.1; NCNT = 2.

The namelist is then ended with a $END card. The next card gives the starting and ending indices of the x and y axes, respectively, which define the area of storage for the terrain heights that follow. The terrain heights begin in Column 15 of the card and are read using the statements shown in Section A.4.3.

The above example problem executed in 302 seconds on the UNIVAC 1108 computer at the University of Utah. The computer output listing for the sample problem is shown in Appendix C.

A.7 OUTPUT TAPE FORMAT

The output tape produced by the program is a binary (odd parity) tape. The data are recorded in integer binary and floating point binary (real) form. The tape (tapes) is in multiple file form where each file represents the output from a single case. The records of each file are arranged as follows:

RECORD 1:

Word 1 - Number of times the arrays UL (u component), VL (v component) and PL (layer height) occur within the file (integer).

Word 2 - Flag where if set to 1 indicates record 4 contains the terrain height data HG. If set to zero, then record 4 contains the first occurrence of UL (integer).

Word 3 - IDIM or the I dimension of the arrays UL, VL, PL and HG (integer).

Word 4 - JDIM or the J dimension of the arrays UL, VL, PL and HG (integer).

Word 5 - LL or the number of values in the x axis in record 2 (integer).

Word 6 - JL or the number of values in the y axis in record 3 (integer).

Word 7 - IST or the starting index on the x axis of uniform grid spacing (integer).

Word 8 - IND or the ending index on the x axis of uniform grid spacing (integer).

Word 9 - JST or the starting index on the y axis of uniform grid spacing (integer).

Word 10 - JND or the ending index on the y axis of uniform grid spacing (integer).

RECORD 2: LL words consisting of the x axis in ascending order (real).

RECORD 3: JL words consisting of the y axis in ascending order (real).

RECORD 4: If Word 2 of Record 1 is set to 1, then Record 4 contains IDIM*JDIM words of terrain height data. The data are arranged as if the following statement were used to write it:

((HG(I,J),I=1,IDIM)J=1,JDIM) - HG is a real variable.

RECORD 5: The u component of the wind speed (real). These data are arranged as if they were written by the following statement:

(UL,(I,J,2),I=1,IDIM),J=1,JDIM)

RECORD 6: The v component of the wind speed (real).

(VL(I,J,2),I=1,IDIM),J=1,JDIM)

RECORD 7: The height of the surface layer (real).

(PL(I,J,2),I=1,IDIM),J=1,JDIM)

Records 5, 6 and 7 are repeated (4, 5 and 6 if word 2 of Record 1 is 0) the number of times indicated in Word 1 of Record 1. If more than one reel of output is written, an end-of-file is placed at the end of the first reel. This file mark will appear within the affected file and will indicate a switching of reels is necessary on input. (The program will rarely require more than one reel of 2400 foot tape, even with several stacked cases.) The program prints the contents of each output tape file at the end of each case loop.

APPENDIX B

COMPUTER PROGRAM LISTING

Appendix B contains a complete listing of the computer program. The program is written in the FORTRAN V language and has been run on a UNIVAC 1108 computer.

CFUN.US MODEL
FOR 01JL-06/11/75-11:27:21 (0.1)

MAIN PROGRAM

STORAGE USED: CODE(1) 000125; DATA(0) 043140; BLANK COMMON(2) 000000

COMMON BLOCKS:

0003 LIM 000003

EXTERNAL REFERENCES (BLOCK, NAME)

0004 JACK
0005 .INTR$
0006 .RDV$
0007 .WIO2$
0010 .STOP$

STORAGE ASSIGNMENT (BLOCK, TYPE, RELATIVE LOCATION, NAME)

0001 000013 1106 0000 043133 3UF 0000 I 043121 I 0003 I 000000 IDIM 0003 I 000001 JDIM
0000 A 043124 J1 0000 I 043122 J11 0000 I 043123 J12 0000 I 043125 J2 0000 I 043126 J4
0000 I 043127 J5 0000 I 043130 J6 0000 I 043131 J7 0000 I 043132 J8 0000 I 043120 ND
0003 I 000002 NP 0000 R 000000 Q

B-2

```
00101      1*          DIMENSION Q(18000)                                              MDL00100
00101      2*    C     THE DIMENSION OF Q IS DETERMINED BY, SIZE MUST BE GREATER THAN OR MDL00200
00101      3*    C     EQUAL TO (3*(IDIM*JDIM*2)+(IDIM*JDIM)+2*IDIM+2*JDIM) WHERE IDIM   MDL00300
00101      4*    C     IS THE SIZE OF THE X DIMENSION AND JDIM IS THE SIZE OF THE Y       MDL00400
00101      5*    C     DIMENSION                                                         MDL00500
00101      6*    C-----------------------------------------------------------------------MDL00600
00101      7*    C     ND IS THE NO. OF TIMES TO EXECUTE ENTIRE PROGRAM                  MDL00700
00101      8*    C     NP IS THE NO. OF TIMES TO EXECUTE PROGRAM USING ONE SET OF        MDL00800
00101      9*    C     DIMENSIONS IDIM AND JDIM                                          MDL00900
00103     10*          COMMON/DIM/IDIM,JDIM,NP                                         MDL01000
00104     11*          READ (5,30) ND                                                  MDL01100
00107     12*          DO 20 I=1,ND                                                    MDL01200
00112     13*          READ (5,30) NP,IDIM,JDIM                                        MDL01300
00117     14*          J11 = IDIM*JDIM                                                 MDL01400
00120     15*          J12 = J11*2                                                     MDL01500
00121     16*          J1 = J12+1                                                      MDL01600
00122     17*          J2 = J1+J12                                                     MDL01700
00123     18*          J4 = J2+J12                                                     MDL01800
00124     19*          J5 = J4+J11                                                     MDL01900
00125     20*          J6 = J5+IDIM                                                    MDL02000
00126     21*          J7 = J6+IDIM                                                    MDL02100
00127     22*          J8 = J7+JDIM                                                    MDL02200
00130     23*          CALL JACK(Q,Q(J1),Q(J2),Q(J4),Q(J5),Q(J6),Q(J7),Q(J8),,,Q(J4),Q, MDL02300
00130     24*         1Q(J4),Q(J2))                                                    MDL02400
00131     25*       20 CONTINUE                                                       MDL02500
00133     26*       30 FORMAT (I2,2I3)                                                MDL02600
```

```
00134      270          STOP                    MDLU2700
00135      280          END                     MDL02800

        END OF COMPILATION:        NO  DIAGNOSTICS.
```

```
@FOR,US JACK
FOR S10L-06/11/73-11:27:22 (0,1)

   SUBROUTINE JACK        ENTRY POINT 005307

   STORAGE USED: CODE(1) 005367; DATA(0) 002261; BLANK COMMON(2) 000000

    COMMON BLOCKS:

    0003   DIM     000003

   EXTERNAL REFERENCES (BLOCK, NAME)

    0004   NOUTHR
    0005   MISC
    0006   XTRAN
    0007   OUTPT
    0010   UVDIR
    0011   NRMLS
    0012   SIN
    0013   COS
    0014   SQRT
    0015   NWDUS
    0016   NIO2$
    0017   NIO1$
    0020   NERR3$

   STORAGE ASSIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    0001   000160 10L      0001   003347 1010G    0001   004005 1030G    0001   004071 1033G    0001   004427 1050G
    0001   004475 1063G    0001   004577 1116G    0001   004614 1121G    0001   005216 1242G    0001   005231 1251G
    0001   000123 130G     0001   000471 140L     0001   000256 172G     0000   001036 2000F    0000   001056 2001F
    0000   001227 2002F    0000   001244 2003F    0000   001315 2004F    0000   001367 2005F    0000   001402 2006F
    0000   001424 2007F    0000   001445 2008F    0000   001512 2009F    0000   001557 2010F    0000   001627 2011F
    0000   001647 2012F    0000   002003 2013F    0000   002013 2014F    0001   000326 212G     0001   000515 257G
    0001   000556 274G     0001   001104 300L     0001   000604 304G     0001   000626 315G     0001   001112 320L
    0001   000671 326G     0001   001130 340L     0001   000757 361G     0001   000764 365G     0001   001000 376G
    0001   001162 360L     0001   000271 40L      0001   001210 400L     0001   001003 401G     0001   001325 440L
    0001   001444 460L     0001   001244 476G     0001   001447 480L     0001   001347 517G     0001   002767 520L
    0001   001412 531G     0001   003403 600L     0001   004526 680L     0001   004550 700L     0001   003230 760G
    0001   004762 760L     0001   003303 773G     0001   005023 780L     0001   000335 80L      0001   005031 800L
    0001   005047 820L     0001   005074 860L     0001   005153 880L     0001   005161 900L     0001   005254 920L
    0000 R 000473 ABLK     0000 R 000631 A1       0000 R 000633 A10      0000 R 000635 A11      0000 R 000634 A12
    0000 R 000721 A13      0000 R 000636 A14      0000 R 000733 A15      0000 R 000640 A16      0000 R 000641 A17
    0000 R 000645 A18      0000 R 000647 A19      0000 R 000632 A2       0000 R 000651 A20      0000 R 000623 A21
    0000 R 000654 A22      0000 R 000705 A23      0000 R 000714 A24      0000 R 000672 A25      0000 R 000713 A26
    0000 R 000726 A27      0000 R 000657 A28      0000 R 000660 A29      0000 R 000637 A3       0000 R 000662 A30
    0000 R 000664 A31      0000 R 000741 A32      0000 R 000653 A33      0000 R 000670 A34      0000 R 000671 A35
    0000 R 000674 A36      0000 R 000676 A37      0000 R 000677 A38      0000 R 000620 A39      0000 R 000720 A4
    0000 R 000665 A40      0000 R 000703 A41      0000 R 000704 A42      0000 R 000621 A43      0000 R 000724 A44
    0000 R 000675 A45      0000 R 000642 A46      0000 R 000661 A47      0000 R 000732 A48      0000 R 000646 A49
    0000 R 000710 A5       0000 R 000702 A50      0000 R 000644 A51      0000 R 000663 A52      0000 R 000650 A53
    0000 R 000667 A54      0000 R 000707 A55      0000 R 000641 A56      0000 R 000712 A57      0000 R 000711 A58
```

0000 R	000717	A59	0000 R	000652	A6	0000 R	000754	A60	0000 R	000735	A61
0000 R	000736	A63	0000 R	000737	A64	0000 R	000700	A65	0000 R	000751	A66
0000 R	000744	A68	0000 R	000745	A69	0000 R	000673	A7	0000 R	000743	A70
0000 R	000723	A72	0000 R	000731	A73	0000 R	000740	A74	0000 R	000624	A75
0000 R	000626	A77	0000 R	000627	A78	0000 R	000622	A79	0000 R	000656	A8
0000 R	000543	A9	0000 R	000715	B1	0000 R	000725	B2M	0000 R	000722	B2P
0000 R	000734	B3P	0000 R	000534	CHK	0000 R	000746	C1	0000 R	000750	C2M
0000 R	000753	C3M	0000 R	000752	C3P	0000 R	000554	DELY	0000 R	000535	DT
0000 R	000556	DYM	0000 R	000555	DYP	0000 R	000666	FM	0000 R	000655	FP
0000 R	000701	GP	0000 R	000500	G1	0000 R	000544	G2	0000 I	000520	I
0000 I	000541	ICNT	0000 I	000000	IDIM	0000 I	000527	IFLAG	0000 I	000507	IJDIM
0000 I	000546	IJDIMP	0000 I	000510	IJKDIM	0000 I	002031	IND	0000	002064	INJPS
0000 I	000513	IREC6	0000 I	000422	ISAVE	0000 I	000000	ISKIP	0000 I	000550	ISM
0000 I	000420	ISPS	0000 I	002030	IST	0000 I	000523	ITAG1	0000 I	000503	IUNIT
0000 I	000001	JDIM	0000 I	002027	JL	0000 I	000516	JLM	0000 I	000553	JM12
0000 I	000526	JPR	0000 I	000552	JP12	0000 I	002032	JST	0000 I	000524	J12
0000 I	000536	K	0000 I	000505	KDIM	0000 I	000537	LINES	0000 I	002026	LL
0000 I	002022	MOUT	0000 I	000551	N	0000 I	000502	NCNT	0000 I	000525	NOGO
0000 I	000512	NPSP	0000 R	000533	PKR	0000 R	000540	PLB	0000 R	000607	PLBI
0000 R	000564	PLXM	0000 R	000611	PLXMI	0000 R	000603	PLXMYP	0000 R	000561	PLXP
0000 R	000606	PLXPYM	0000 R	000600	PLXYM	0000 R	000615	PLXYMI	0000 R	000575	PLXYP
0000 R	000572	PLYM	0000 R	000613	PLYMI	0000 R	000567	PLYP	0000 R	000612	PLYPI
0000 R	000616	PXMYPI	0000 R	000617	PXPYMI	0000	000757	@LST1	0000 R	000472	RAD
0000 R	000511	SS	0000 R	000522	STOP	0000 R	000542	TIM	0000 R	000755	TIME
0000 R	000514	ULB	0000 R	000474	ULT	0000 R	000562	ULXM	0000 R	000601	ULXMYP
0000 R	000604	ULXPYM	0000 R	000576	ULXYM	0000 R	000573	ULXYP	0000 R	000570	ULYM
0000 R	000515	VLB	0000 R	000475	VLT	0000 R	000563	VLXM	0000 R	000602	VLXMYP
0000 R	000605	VLXPYM	0000 R	000577	VLXYM	0000 R	000574	VLXYP	0000 R	000571	VLYM
0000 R	000756	VORT	0000 R	000012	X	0000 R	000532	XMAX	0000 R	000531	XMIN
0000 R	000132	Y	0000 R	000323	YPS						

```
00101     1*          SUBROUTINE JACK(UL,VL,PL,HG,  DELXI,DXPI,  DELYJ,DYPJ,CONTP,HGQ,ULJCK00100
00101     2*         1Q,VLQ,PLQ)                                                      JCK00200
00101     3*     C                                                                    JCK00300
00101     4*     C  *-*  PROGRAM INPUT AND CONTROL PARAMETERS - REFER TO THE NAMELIST *-*JCK00400
00101     5*     C  *-*  JLST1 BELOW FOR INPUTS TO THIS ROUTINE                      *-*JCK00500
00101     6*     C                                                                    JCK00600
00101     7*     C     DT -R- TIME INCREMENT (SECONDS).                               JCK00700
00101     8*     C     HG(I,J) -R- HEIGHT OF LAND AT COORDINATES (I,J).               JCK00800
00101     9*     C     IFLAG -I- FLAG TO INDICATE THE PROBLEM IS GROWING UNSTABLE     JCK00900
00101    10*     C     JL -I- NUMBER OF GRID POINTS IN J DIRECTION                    JCK01000
00101    11*     C     JLM -I- JL MINUS ONE.                                          JCK01100
00101    12*     C     LL -I- NUMBER OF GRID POINTS IN I DIRECTION                    JCK01200
00101    13*     C     LLM -I- LL MINUS ONE.                                          JCK01300
00101    14*     C     PL(I,J,K) -R- HEIGHT OF SURFACE LAYER                          JCK01400
00101    15*     C     PLT -R- INITIAL HEIGHT OF SURFACE LAYER                        JCK01500
00101    16*     C     UL(I,J,K) -R- U COMPONENT OF THE WIND IN THE LOWER LAYER       JCK01600
00101    17*     C     ULT -R- U COMPONENT OF LOWER LAYER WIND (INITIAL CONDITION)    JCK01700
00101    18*     C           OR MEAN WIND SPEED DEPENDING ON ISKIP(4)                 JCK01800
00101    19*     C     VL(I,J,K) -R- V COMPONENT OF THE WIND IN THE LOWER LAYER       JCK01900
00101    20*     C     VLT -R- V COMPONENT OF LOWER LAYER WIND (INITIAL CONDITION)    JCK02000
00101    21*     C           OR WIND DIRECTION DEPENDING ON ISKIP(4)                  JCK02100
00101    22*     C     X(I) -R- X COORDINATE VALUE I.                                 JCK02200
00101    23*     C     Y(I) -R- Y COORDINATE VALUE I.                                 JCK02300
```

```
00101  ...  C     PRINT -R- ARRAY CONTAINING THE TIME IN MINUTES AT WHICH THE        JCK02400
00101  ...  C               WIND FIELD AND LAYER HEIGHT ARRAYS ARE TO BE PRINTED    JCK02500
00101  ...  C               AND/OR OUTPUT TO TAPE. THE VALUES ARE IN ASCENDING ORDERJCK02600
00101  ...  C               AND THE MAXIMUM IS USED AS THE PROBLEM STOP VALUE.      JCK02700
00101  ...  C     IST -I- INDEX OF THE FIRST POINT IN THE X ARRAY AT WHICH UNIFORM  JCK02800
00101  ...  C             SPACING OCCURS ALONG THE AXIS                            JCK02900
00101  ...  C     JST -I- INDEX OF THE FIRST POINT IN THE Y ARRAY AT WHICH UNIFORM  JCK03000
00101  ...  C             SPACING OCCURS ALONG THE AXIS                            JCK03100
00101  ...  C     INU AND JND -I- INDICES OF THE LAST POINT IN THE X AND Y ARRAYS ATJCK03200
00101  ...  C             WHICH UNIFORM SPACING STOPS ALONG THE X AND Y AXES        JCK03300
00101  ...  C     NCNT -I- NUMBER OF ITERATIVE TIME STEPS BETWEEN THE RECALCULATIONSJCK03400
00101  ...  C             OF DT (TIME INCREMENT BETWEEN TIME STEPS)                 JCK03500
00101  ...  C     DTLMDA -R- STABILITY FACTOR FOR CALCULATING THE TIME STEP DT.    JCK03600
00101  ...  C               THIS VALUE SHOULD BE AS CLOSE TO 1 AS POSSIBLE AND     JCK03700
00101  ...  C               STILL MAINTAIN PROGRAM STABILITY. THE PROGRAM ASSUMES  JCK03800
00101  ...  C               .95 IF NO OTHER VALUE IS INPUT. IF AN IFLAG ERROR      JCK03900
00101  ...  C               OCCURS DTLMDA SHOULD BE REDUCED                        JCK04000
00101  ...  C     ISMOTH -I- NUMBER OF TIME STEPS BETWEEN THE APPLICATION OF A     JCK04100
00101  ...  C               SMOOTHING FUNCTION IN SPACE                            JCK04200
00101  ...  C     G1 -R- REDUCED GRAVITY FACTOR = G*(1-S) WHERE G = 9.8 M/SEC**2   JCK04300
00101  ...  C               AND S IS THE RATIO OF THE POTENTIAL TEMP AT THE TOP     JCK04400
00101  ...  C               OF THE LAYER OVER THE POTENTIAL TEMP AT THE BOTTOM      JCK04500
00101  ...  C     ABLK - MINIMUM ALOWABLE LAYER DEPTH                              JCK04600
00101  ...  C     ISKIP(1) -I- IF SET TO 1 THE CALCULATED WIND FIELD AND LAYER     JCK04700
00101  ...  C                 HEIGHTS ARE PRINTED AT EACH TIME STEP IN THE ARRAY   JCK04800
00101  ...  C                 PRINT                                                JCK04900
00101  ...  C     ISKIP(2) -I- IF SET TO 1 THE WIND FIELD AND LAYER HEIGHTS ARE    JCK05000
00101  ...  C                 OUTPUT TO TAPE AT EACH TIME STEP IN THE ARRAY PRINT  JCK05100
00101  ...  C     ISKIP(3) -I- IF SET TO 1 THE TERRAIN HEIGHT MATRIX IS OUTPUT TO  JCK05200
00101  ...  C                 TAPE                                                 JCK05300
00101  ...  C     ISKIP(4) - IF SET TO 0 THE PROGRAM ASSUMES ULT AND VLT ARE INPUT JCK05400
00101  ...  C                AS THE U AND V COMPONENTS OF THE WIND SPEED AND THE   JCK05500
00101  ...  C                U AND V COMPONENTS ARE PRINTED IN THE WIND FIELD OUTPUTJCK05600
00101  ...  C                IF SET TO 1 ULT AND VLT ARE THE U AND V COMPONENTS OF JCK05700
00101  ...  C                THE WIND SPEED AND WIND SPEED AND DIRECTION ARE PRINTEDJCK05800
00101  ...  C                IN THE WIND FIELD OUTPUT                              JCK05900
00101  ...  C                IF SET TO 2 ULT AND VLT ARE THE WIND SPEED AND        JCK06000
00101  ...  C                DIRECTION AND THE U AND V COMPONENTS OF THE WIND SPEED JCK06100
00101  ...  C                ARE PRINTED IN THE WIND FIELD OUTPUT                  JCK06200
00101  ...  C                IF SET TO 3 ULT AND VLT ARE THE WIND SPEED AND        JCK06300
00101  ...  C                DIRECTION AND THE WIND SPEED AND DIRECTION ARE PRINTED JCK06400
00101  ...  C                IN THE WIND FIELD OUTPUT                              JCK06500
00101  ...  C                THE U AND V COMPONENTS ONLY ARE OUTPUT TO TAPE IF TAPE JCK06600
00101  ...  C                OUTPUT IS REQUESTED                                   JCK06700
00101  ...  C     ISKIP(5) - IF SET TO 0 THE PROGRAM READS THE TERRAIN INDICES AND  JCK06800
00101  ...  C                HEIGHTS VIA SUBROUTINE MOUTNR                         JCK06900
00101  ...  C                IF SET TO 1 THE PROGRAM USES THE TERRAIN DATA USED IN JCK07000
00101  ...  C                THE PREVIOUS CASE                                     JCK07100
00101  ...  C                REFER TO SUBROUTINE MOUTNR FOR TERRAIN INPUTS AND     JCK07200
00101  ...  C                FORMAT                                                JCK07300
00101  ...  C     IUNIT -I- FORTRAN LOGICAL OUTPUT TAPE UNIT (CANNOT BE ZERO)      JCK07400
00101  ...  C     THE PROGRAM ASSUMES LOGICAL UNIT 1 AS THE STARTING OUTPUT UNIT   JCK07500
00101  ...  C     IF MORE THAN ONE REEL IS EXPECTED A SECOND UNIT MUST BE ASSIGNED  JCK07600
00101  ...  C     AS IUNIT+1                                                       JCK07700
00101  ...  C                                                                      JCK07800
00101  ...  C     OUTPUT TAPE FILE FORMAT - TAPE IS BINARY, OUTPUT IS VIA NTRAN    JCK07900
00101  ...  C              RECORD 1 - 7 WORDS OF INTEGER INFORMATION               JCK08000
```

```
00101   61*     C                       WORD 1 NUMBER OF TIMES THE ARRAYS UL, VL AND PL  JCK08100
00101   62*     C                              ARE OUTPUT                                JCK08200
00101   63*     C                       WORD 2 FLAG WHERE IF SET TO 1 TERRAIN HEIGHT DATAJCK08300
00101   64*     C                              IS ON THE TAPE. IF ZERO THERE IS NO       JCK08400
00101   65*     C                              TERRAIN DATA ON TAPE                      JCK08500
00101   66*     C                       WORD 3 IS IDIM (THE I DIMENSION OF UL, VL, PL    JCK08600
00101   67*     C                              AND HG (UL(IDIM,JDIM,2)) )                JCK08700
00101   68*     C                       WORD 4 IS JDIM (THE J DIMENSION OF UL, VL, PL    JCK08800
00101   69*     C                              AND HG                                    JCK08900
00101   70*     C                       WORD 5 IS LL (THE NO OF POINTS IN THE X AXIS OR  JCK09000
00101   71*     C                              NO OF WORDS USED WITHIN IDIM)             JCK09100
00101   72*     C                       WORD 6 IS JL (THE NO OF POINTS IN THE Y AXIS OR  JCK09200
00101   73*     C                              NO OF WORDS USED WITHIN JDIM)             JCK09300
00101   74*     C                       WORD 7 IS IST                                    JCK09400
00101   75*     C                       WORD 8 IS IND                                    JCK09500
00101   76*     C                       WORD 9 IS JST                                    JCK09600
00101   77*     C                       WORD 10 IS JND                                   JCK09700
00101   78*     C               RECORD 2 - THE X AXIS ARRAY  (X(I),I=1,LL)               JCK09800
00101   79*     C               RECORD 3 - THE Y AXIS ARRAY  (Y(J),J=1,JL)               JCK09900
00101   80*     C               RECORD 4 - THE TERRAIN HEIGHT ARRAY (HG0(I),I=1,IJDIM)   JCK10000
00101   81*     C                          ONLY IF ISKIP(3) OR WORD 2 OF RECORD 1 IS SET JCK10100
00101   82*     C                          TO 1. OTHERWISE HG IS NOT OUTPUT TO TAPE. THE JCK10200
00101   83*     C                          PARAMETER IJDIM ABOVE IS EQUAL TO IDIM*JDIM   JCK10300
00101   84*     C               RECORD 5 - THE U COMPONENT OF THE WIND SPEED             JCK10400
00101   85*     C                          (UL0(I),I=1,IJDIM) THIS IS EQUIVALENT TO     JCK10500
00101   86*     C                          (((UL(I,J,1),I=1,IDIM),J=1,JDIM)             JCK10600
00101   87*     C               RECORD 6 - THE V COMPONENT OF THE WIND SPEED             JCK10700
00101   88*     C                          (VL0(I),I=1,IJDIM)                           JCK10800
00101   89*     C               RECORD 7 - THE HEIGHT OF THE MIXING LAYER                JCK10900
00101   90*     C                          (PL0(I),I=1,IJDIM)                           JCK11000
00101   91*     C               RECORDS 5,6,7 ARE REPEATED FOR EACH INDICATED TIME STEP  JCK11100
00101   92*     C     END OF FILE - THE FILE FORMAT IS REPEATED FOR EACH OUTPUT CASE     JCK11200
00101   93*     C      NOTE - IN THE CASE MORE THAN ONE REEL IS WRITTEN A FILE COULD     JCK11300
00101   94*     C      SPAN BOTH REELS. IN THIS CASE A FILE MARK WILL APPEAR WITHIN THE  JCK11400
00101   95*     C      FILE THAT SPANS THE REELS AND WILL INDICATE END OF TAPE ONE.      JCK11500
00101   96*     C      THE PROGRAM WILL PRINT THE CONTENTS OF EACH FILE AT THE END OF A  JCK11600
00101   97*     C      PROBLEM RUN AND WILL INDICATE IF ONE OR TWO REELS WERE WRITTEN    JCK11700
00101   98*     C                                                                       JCK11800
00101   99*     C                          *** PROGRAM INPUT UNITS ***                  JCK11900
00101  100*     C     ULT,VLT - METERS/SECOND OR (METERS/SECOND, DEGREES)               JCK12000
00101  101*     C     PLT,HG,X,Y,ABLK - METERS                                          JCK12100
00101  102*     C     PRINT - MINUTES                                                   JCK12200
00101  103*     C     G1 - METERS/SECOND**2                                             JCK12300
00101  104*     C                                                                       JCK12400
00101  105*     C                          *** PROGRAM DEFAULT VALUES ***               JCK12500
00101  106*     C     ABLK = 50, DTLMDA= .95, G1= 0.1, ISMOTH=10, NCNT= 2,              JCK12600
00101  107*     C     ISKIP(1) = 0, ISKIP(2) = 1 (ONLY IF ISKIP(1)=0), ISKIP(3)= 0,     JCK12700
00101  108*     C     ISKIP(4) = 0, ISKIP(5, = 0.IUNIT=1 (THEN 2 FOR SECOND REEL),      JCK12800
00101  109*     C     LL = IDIM, JL = JDIM (IF X(2)=0.0 AND Y(2)=0.0 THEN LL=41, JL=41  JCK12900
00101  110*     C       AND THE X AND Y ARRAYS ARE FILLED WITH THE WSMR UTM COORDINATES  JCK13000
00101  111*     C       IN THE ARRAYS XPS AND YPS BELOW AND ARE CONVERTED TO METERS)     JCK13100
00101  112*     C                                                                       JCK13200
00101  113*     C***** DECLARATIONS. *****                                              JCK13300
00101  114*     C                                                                       JCK13400
00103  115*           COMMON/DIM/IDIM,JDIM,IJDIM                                        JCK13500
00104  116*           DIMENSION UL(IDIM,JDIM,2),VL(IDIM,JDIM,2),PL(IDIM,JDIM,2),HG(IDIM,JCK13600
00104  117*          1JDIM),DELAI(IDIM),DXPI(IDIM),DELYJ(JDIM),DYPJ(JDIM),CONTP(IDIM,JDICK13700
```

```
00104        2M,2,3)                                                       JCK13800
00105        DIMENSION ISKIP(10),X(80),Y(80)                               JCK13900
00106        DIMENSION MOUT(10),XPS(41),YPS(41),PRINT(20),ISPS(2),ISAVE(20),  JCK14000
00106       1TSAVE(20)                                                      JCK14100
00107        EQUIVALENCE (MOUT(5),LL),(MOUT(6),JL),(MOUT(7),IST),(MOUT(8),IND),JCK14200
00107       1(MOUT(9),JST),(MOUT(10),JND)                                   JCK14300
00107   C    STANDARD WHITE SANDS GRID IN UTM COORDINATES (KILOMETERS)      JCK14400
00110        DATA XPS/100.,180.,260.,300.,320.,330.,335.,340.,345.,350.,355.,  JCK14500
00110       1360.,365.,370.,375.,380.,385.,390.,395.,400.,405.,410.,415.,420.,  JCK14600
00110       2425.,430.,435.,440.,445.,450.,455.,460.,465.,470.,475.,480.,490.,  JCK14700
00110       3510.,550.,630.,710./                                           JCK14800
00112        DATA YPS/3340.,3420.,3500.,3540.,3560.,3570.,3575.,3580.,3585.,  JCK14900
00112       13590.,3595.,3600.,3605.,3610.,3615.,3620.,3625.,3630.,3635.,3640.,JCK15000
00112       23645.,3650.,3655.,3660.,3665.,3670.,3675.,3680.,3685.,3690.,3695.,JCK15100
00112       33700.,3705.,3710.,3715.,3720.,3730.,3750.,3790.,3870.,3950.,   JCK15200
00112   C                                                                   JCK15300
00114        DATA ISPS/'0','1'/,RAD/.01745329/                              JCK15400
00117        DIMENSION HGQ(1),ULQ(1),VLQ(1),PLQ(1)                          JCK15500
00120        NAMELIST/QLST1/LL,JL,X,Y,ISKIP,ABLK,PRINT,ULT,VLT,PLT,DTLMDA,G1,  JCK15600
00120       1ISMOTH,NCNT,IUNIT                                              JCK15700
00121        SQ2I = .70710678                                               JCK15800
00121   C                                                                   JCK15900
00121   C***** START OF EXECUTABLE STATEMENTS. *****                        JCK16000
00121   C                                                                   JCK16100
00122        KDIM = 2                                                       JCK16200
00122   C    IDIM,JDIM,KDIM ARE THE I,J,K DIMENSIONS IN THE ABOVE 3 DIMENSIONALJCK16300
00122   C    PARAMETERS.  IDIM,JDIM ARE THE I,J DIMENSIONS OF HG, TSFC, CD.   JCK16400
00123        IPIDIM = IDIM+IDIM                                             JCK16500
00124        IJDIM = IDIM*JDIM                                              JCK16600
00125        IJKDIM = IJDIM*KDIM                                            JCK16700
00126        SS = 0.5                                                       JCK16800
00127        DO 1000 NPSP=1,NP                                              JCK16900
00132        IREC6 = 0                                                      JCK17000
00133        READ (5,QLST1)                                                 JCK17100
00136        IF (ISKIP(4) .LT. 2) GO TO 10                                  JCK17200
00140        VLT = VLT+180.0                                                JCK17300
00141        ULB = ULT*SIN(VLT*RAD)                                         JCK17400
00142        VLB = ULT*COS(VLT*RAD)                                         JCK17500
00143        ULT = ULB                                                      JCK17600
00144        VLT = VLB                                                      JCK17700
00145     10 CONTINUE                                                       JCK17800
00145   C    PROVIDE DEFAULT PARAMETERS FOR VARIABLES NOT SET               JCK17900
00146        IF (LL .LE. 0) LL = IDIM                                       JCK18000
00150        IF (JL .LE. 0) JL = JDIM                                       JCK18100
00152        JLM = JL-1                                                     JCK18200
00153        LLM = LL-1                                                     JCK18300
00154        IF (ISKIP(1) .EQ. 0.AND.ISKIP(2) .EQ. 0) ISKIP(2) =1            JCK18400
00156        IF (ABLK .LE. 0.0) ABLK = 50.0                                 JCK18500
00160        IF (DTLMDA .LE. 0.0) DTLMDA = .95                              JCK18600
00162        IF (G1 .LE. 0.0) G1 = 0.1                                      JCK18700
00164        IF (ISMOTH .LE. 0) ISMOTH = 10                                 JCK18800
00166        IF (NCNT .LE. 0  ) NCNT = 2                                    JCK18900
00170        MOUT(1) = 1                                                    JCK19000
00171        DO 20 I=1,19                                                   JCK19100
00174        IF (PRINT(I) .GT. PRINT(I+1)) GO TO 40                         JCK19200
00176        MOUT(1) = MOUT(1)+1                                            JCK19300
00177     20 CONTINUE                                                       JCK19400
```

```
00201          40 J13 = MOUT(1)
00202             STOP = PRINT(J13)
00203             IF (X(2) .GT. 0.0.AND.Y(2) .GT. 0.0) GO TO 80
00205             LL = 41
00206             LLM = LL-1
00207             JL = 41
00210             JLM = JL-1
00211             DO 60 I=1,LL
00214             X(I) = XPS(I)*1.0E3
00215          60 Y(I) = YPS(I)*1.0E3
00217          80 CONTINUE
00217       C     INPUT TERRAIN HEIGHTS WITHIN THE GRID AREA
00220             IF (ISKIP(5) .EQ. 0) CALL MOUTNR(HG,LL,JL,X,Y)
00220       C     INITIALIZE OUTPUT TAPE DATA IF DESIRED
00222             ITAG1 = 0
00223             IF (ISKIP(2) .NE. 1) GO TO 140
00225             MOUT(2) = ISKIP(3)
00226             MOUT(3) = IDIM
00227             MOUT(4) = JDIM
00227       C     DETERMINE COORDINATE INDICES OF AREA OF UNIFORM GRID SPACING
00227       C     WITHIN THE GRID
00230             CALL MISC(IST,IND,X,LL,LLM)
00231             CALL MISC(JST,JND,Y,JL,JLM)
00232             ITAG1=1
00233             IF (IUNIT .LE. 0) IUNIT = 1
00235             CALL NTRAN(IUNIT,22)
00236             J12 = 10
00237             CALL OUTPT(IUNIT,J12,MOUT,NOGO)
00240             IF (NOGO .EQ. 1) GO TO 900
00242             CALL OUTPT(IUNIT,LL,X,NOGO)
00243             IF (NOGO .EQ. 1) GO TO 900
00245             CALL OUTPT(IUNIT,JL,Y,NOGO)
00246             IF (NOGO .EQ. 1) GO TO 900
00250             IF (ISKIP(3) .NE. 1) GO TO 140
00252             CALL OUTPT(IUNIT,IJDIM,HGO,NOGO)
00253             IF (NOGO .EQ. 1) GO TO 900
00255         140 CONTINUE
00255       C     CALCULATE INITIAL VALUES OF WIND AND PRESSURE
00256             DO 160 I=1,IJDIM
00261             PLO(I) = PLT-HGO(I)
00261       C     TEST FOR TERRAIN PENETRATION OF LAYER
00262             IF (PLO(I) .LT. ABLK) PLO(I) = ABLK
00264             ULO(I) = ULT*PLO(I)
00265             VLO(I) = VLT*PLO(I)
00266         160 CONTINUE
00270             JPN=1
00271             IFLAG=0
00271       C
00271       C----- ELIMINATE DIVISIONS IN THE X DIRECTION.
00272             DXPI(1) = 1.0/(X(2)-X(1))
00273             DO 180 I=2,LLM
00276             DELXI(I)=1.0/(X(I+1)-X(I-1))
00277             DXPI(I)=1.0/(X(I+1)-X(I))
00300         180 CONTINUE
00300       C
00300       C----- ELIMINATE DIVISIONS IN THE Y DIRECTION.
00302             DYPJ(1) = 1.0/(Y(2)-Y(1))
```

```
00303   2540          DO 200 J=2,JLM                                          JCK25200
00306   2550          DELYJ(J)=1.0/(Y(J+1)-Y(J-1))                            JCK25300
00307   2560          DYPJ(J)=1.0/(Y(J+1)-Y(J))                               JCK25400
00310   2570      200 CONTINUE                                                JCK25500
00312   2580          XMIN = 1.0E5                                            JCK25600
00313   2590          XMAX = -1.0E5                                           JCK25700
00313   2600    C     CALCULATE INITIAL TIME INCREMENT (DT)                   JCK25800
00316   2610          DO 220 I=1,IJDIM                                        JCK25900
00317   2620          PKR = 1.0/PL0(I)                                        JCK26000
00320   2630          CHK = SQRT((UL0(I)*PKR)**2+(VL0(I)*PKR)**2)+SQRT(G1*PL0(I))  JCK26100
00321   2640          IF (CHK .GT. XMAX) XMAX = CHK                           JCK26200
00323   2650      220 CONTINUE                                                JCK26300
00325   2660          DO 240 I=1,LLM                                          JCK26400
00326   2670          CHK = X(I+1)-X(I)                                       JCK26500
00331   2680          IF (CHK .LT. XMIN) XMIN = CHK                           JCK26600
00333   2690      240 CONTINUE                                                JCK26700
00336   2700          DT = DTLMDA*XMIN/XMAX                                   JCK26800
00336   2710          IF (JL .GT. 3) DT = DT*SQRT                             JCK26900
00340   2720          WRITE (6,2000)                                          JCK27000
00342   2730          WRITE (6,2001) IDIM,JDIM,LL,JL,ABLK,ULT,VLT,PLT,ISMOTH,NCNT,DT,  JCK27100
00342   2740         1DTLMDA,G1,PRINT,ISKIP                                   JCK27200
00371   2750          IF (ISKIP(1) .EQ. 0) GO TO 388                          JCK27300
00371   2760    C     OUTPUT INITIAL WINDFIELD, HEIGHT AND TERRAIN DATA       JCK27400
00373   2770          K = ISPS(1)                                             JCK27500
00376   2780          LINES = 60                                              JCK27600
00375   2790          DO 370 J=1,JL                                           JCK27700
00400   2800          DO 360 I=1,LL                                           JCK27800
00403   2810          PLB = 1.0/PL(I,J,1)                                     JCK27900
00404   2820          ULB = UL(I,J,1)*PLB                                     JCK28000
00406   2830          VLB = VL(I,J,1)*PLB                                     JCK28100
00406   2840          PLB = PL(I,J,1)+HG(I,J)                                 JCK28200
00407   2850          LINES = LINES+1                                         JCK28300
00410   2860          IF (LINES .LT. 58) GO TO 320                            JCK28400
00412   2870          LINES = 6                                               JCK28500
00413   2880          WRITE (6,2002)                                          JCK28600
00415   2890          IF (ISKIP(4) .EQ. 1.OR.ISKIP(4) .EQ. 3) GO TO 300       JCK28700
00417   2900          WRITE (6,2003) K                                        JCK28800
00422   2910          GO TO 320                                               JCK28900
00423   2920      300 WRITE (6,2004) K                                        JCK29000
00426   2930      320 IF (ISKIP(4) .EQ. 0.OR.ISKIP(4) .EQ. 2) GO TO 340       JCK29100
00430   2940          CALL UVDIR(ULB,VLB)                                     JCK29200
00431   2950      340 WRITE (6,2005) I,J,X(I),Y(J),ULB,VLB,PLB,HG(I,J)        JCK29300
00443   2960      360 CONTINUE                                                JCK29400
00446   2970          LINES = 60                                              JCK29500
00446   2980      370 CONTINUE                                                JCK29600
00450   2990      380 CONTINUE                                                JCK29700
00451   3000          ICNT = 0                                                JCK29800
00452   3010          TIM = 0.0                                               JCK29900
00453   3020          A9 = DT*DT*0.5                                          JCK30000
00456   3030          G2 = 0.5*G1                                             JCK30100
00456   3040          IBL2 = 0                                                JCK30200
00456   3050          IF (KDIM .GT. 2) IBL2 = IJDIM                           JCK30300
00460   3060          IJDIMP = 1-IBL2                                         JCK30400
00461   3070          IJDIMM = -1-IBL2                                        JCK30500
00462   3080          ISM = 0                                                 JCK30600
00463   3090          N = 0                                                   JCK30700
00464   3100      400 N = N+1                                                 JCK30800
```

```
00465          IF (ISM .GE. ISMOOTH) ISM = 0                                  JCK30900
00467          ISM = ISM+1                                                    JCK31000
00470          ICNT = ICNT+1                                                  JCK31100
00471          IF (ICNT .LT. NCNT) GO TO 440                                  JCK31200
00473          ICNT = 0                                                       JCK31300
00474          XMAX = -1.0E5                                                  JCK31400
00475          DO 420 I=1,IJDIM                                               JCK31500
00500          PKR = 1.0/PLQ(I)                                               JCK31600
00501          CHK = SQRT((ULQ(I)*PKR)**2+(VLQ(I)*PKR)**2)+SQRT(G1*PLJ(I))    JCK31700
00502          IF (CHK .GT. XMAX) XMAX = CHK                                  JCK31800
00504      420 CONTINUE                                                       JCK31900
00506          DT = DTLMDA*XMIN/XMAX                                          JCK32000
00507          IF (JL .GT. 3) DT = DT*SQ2I                                    JCK32100
00511          A9 = DT*DT*0.5                                                 JCK32200
00512      440 CONTINUE                                                       JCK32300
00513          TIM = TIM+DT                                                   JCK32400
00514          IF (IFLAG .GT. 0) GO TO 700                                    JCK32500
00514    C                                                                    JCK32600
00514    C                                                                    JCK32700
00514    C*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*.*JCK32800
00514    C***** GRID POINT CALCULATION LOOP. *****                            JCK32900
00514    C                                                                    JCK33000
00516          DO 500 J=2,JLM                                                 JCK33100
00521          JP12 = J*IDIM+1+IBL2                                           JCK33200
00522          JM12 = JP12-IPIDIM                                             JCK33300
00523          J12 = JP12-IDIM                                                JCK33400
00524          J13 = IJDIM+J12                                                JCK33500
00525          DELY = DELYJ(J)                                                JCK33600
00526          DYP = DYPJ(J)                                                  JCK33700
00527          DYM = DYPJ(J-1)                                                JCK33800
00530          DO 500 I=2,LLM                                                 JCK33900
00533          JP12 = JP12+1                                                  JCK34000
00534          JM12 = JM12+1                                                  JCK34100
00535          J12 = J12+1                                                    JCK34200
00536          J13 = J13+1                                                    JCK34300
00537          PLB = PLQ(J12)                                                 JCK34400
00537    C     TEST FOR STABLE SOLUTION.IF NOT-BRANCH                         JCK34500
00540          IF (IFLAG .GT. 0) GO TO 520                                    JCK34600
00542          IF (PLB .GT. 20000.0) GO TO 460                                JCK34700
00544          GO TO 480                                                      JCK34800
00545      460 IFLAG = N                                                      JCK34900
00546          GO TO 520                                                      JCK35000
00547      480 CONTINUE                                                       JCK35100
00547    C                                                                    JCK35200
00547    C     THE FOLLOWING COMPUTATIONS DO NOT REFLECT THE FORM OF          JCK35300
00547    C     THE MODEL EQUATIONS DUE TO ALTERATIONS FOR CALCULATION EFFICIENCY JCK35400
00547    C                                                                    JCK35500
00550          ULB = ULQ(J12)                                                 JCK35600
00551          VLB = VLQ(J12)                                                 JCK35700
00552          ULXP = ULQ(J12+1)                                              JCK35800
00553          VLXP = VLQ(J12+1)                                              JCK35900
00554          PLXP = PLQ(J12+1)                                              JCK36000
00555          ULXM = ULQ(J12-1)                                              JCK36100
00556          VLXM = VLQ(J12-1)                                              JCK36200
00557          PLXM = PLQ(J12-1)                                              JCK36300
00560          ULYP = ULQ(JP12)                                               JCK36400
00561          VLYP = VLQ(JP12)                                               JCK36500
```

```
00562    366*    PLYP = PLQ(JP12)                                    JCK36600
00563    367*    ULYM = ULQ(JM12)                                    JCK36700
00564    368*    VLYM = VLQ(JM12)                                    JCK36800
00565    369*    PLYM = PLQ(JM12)                                    JCK36900
00566    370*    ULXYP = ULQ(JP12+1)                                 JCK37000
00567    371*    VLXYP = VLQ(JP12+1)                                 JCK37100
00570    372*    PLXYP = PLQ(JP12+1)                                 JCK37200
00571    373*    ULXYM = ULQ(JM12-1)                                 JCK37300
00572    374*    VLXYM = VLQ(JM12-1)                                 JCK37400
00573    375*    PLXYM = PLQ(JM12-1)                                 JCK37500
00574    376*    ULXMYP = ULQ(JP12-1)                                JCK37600
00575    377*    VLXMYP = VLQ(JP12-1)                                JCK37700
00576    378*    PLXMYP = PLQ(JP12-1)                                JCK37800
00577    379*    ULXPYM = ULQ(JM12+1)                                JCK37900
00600    380*    VLXPYM = VLQ(JM12+1)                                JCK38000
00601    381*    PLXPYM = PLQ(JM12+1)                                JCK38100
00602    382*    PLBI = 1.0/PLB                                      JCK38200
00603    383*    PLXPI = 1.0/PLXP                                    JCK38300
00604    384*    PLXMI = 1.0/PLXM                                    JCK38400
00605    385*    PLYPI = 1.0/PLYP                                    JCK38500
00606    386*    PLYMI = 1.0/PLYM                                    JCK38600
00607    387*    PLXYPI = 1.0/PLXYP                                  JCK38700
00610    388*    PLXYMI = 1.0/PLXYM                                  JCK38800
00611    389*    PXMYPI = 1.0/PLXMYP                                 JCK38900
00612    390*    PXPYMI = 1.0/PLXPYM                                 JCK39000
00613    391*    A39 = HGQ(J12-IBL2)                                 JCK39100
00614    392*    A43 = HGQ(JP12-IBL2)                                JCK39200
00615    393*    A79 = HGQ(JM12-IBL2)                                JCK39300
00616    394*    A21 = HGQ(J12+IJDIMP)                               JCK39400
00617    395*    A75 = HGQ(JP12+IJDIMP)                              JCK39500
00620    396*    A76 = HGQ(JM12+IJDIMP)                              JCK39600
00621    397*    A77 = HGQ(JP12+IJDIMM)                              JCK39700
00622    398*    A78 = HGQ(J12+IJDIMM)                               JCK39800
00623    399*    A80 = HGQ(JM12+IJDIMM)                              JCK39900
00624    400*    A1 = 2.0*DELXI(I)                                   JCK40000
00625    401*    A2 = 2.0*DELY                                       JCK40100
00626    402*    A10 = ULXP*PLXPI                                    JCK40200
00627    403*    A12 = ULXP*A10                                      JCK40300
00630    404*    A11 = ULB*PLBI                                      JCK40400
00631    405*    A14 = ULB*A11                                       JCK40500
00632    406*    A3 = PLXP*PLXP                                      JCK40600
00633    407*    A16 = PLB*PLB                                       JCK40700
00634    408*    A53 = 0.5*DELY                                      JCK40800
00635    409*    A46 = ULXYP*PLXYPI                                  JCK40900
00636    410*    A17 = A46*VLXYP                                     JCK41000
00637    411*    A51 = ULXPYM*PXPYMI                                 JCK41100
00640    412*    A18 = A51*VLXPYM                                    JCK41200
00641    413*    A49 = ULYP*PLYPI                                    JCK41300
00642    414*    A19 = A49*VLYP                                      JCK41400
00643    415*    A53 = ULYM*PLYMI                                    JCK41500
00644    416*    A20 = A53*VLYM                                      JCK41600
00645    417*    A6 = A19-A20                                        JCK41700
00646    418*    A33 = (PLAP+PLB)*G2                                 JCK41800
00647    419*    A22 = A21-A39                                       JCK41900
00650    420*    FP = GXPI(I)*((A12-A14+G2*(A3-A16))+A33*A22)+A56*(A17-A18+A6)   JCK42000
00651    421*    A8 = ULXM*PLXMI                                     JCK42100
00652    422*    A28 = ULXM*A8                                       JCK42200
```

```
00653     423*          A23 = PLXM*PLXM                                                      JCK42300
00654     424*          A47 = ULXMYP*PXMYPI                                                  JCK42400
00655     425*          A30 = A47*VLXMYP                                                     JCK42500
00656     426*          A52 = ULXYM*PLXYMI                                                   JCK42600
00657     427*          A31 = A52*VLXYM                                                      JCK42700
00660     428*          A40 = (PLB+PLXM)*G2                                                  JCK42800
00661     429*          FM = DXPI(I-1)*((A14-A28+G2*(A16-A29))+A40*(A39-A78))+A56*(A6+A30-JCK42900
00661     430*         1A31)                                                                 JCK43000
00662     431*          A54 = 0.5*DELXI(I)                                                   JCK43100
00663     432*          A34 = A10*VLXP                                                       JCK43200
00664     433*          A35 = A8*VLXM                                                        JCK43300
00665     434*          A25 = A34-A35                                                        JCK43400
00666     435*          A7 = VLYP*PLYPI                                                      JCK43500
00667     436*          A36 = VLYP*A7                                                        JCK43600
00670     437*          A45 = VLB*PLBI                                                       JCK43700
00671     438*          A37 = A45*VLB                                                        JCK43800
00672     439*          A38 = PLYP*PLYP                                                      JCK43900
00673     440*          A65 = G2*(PLYP+PLB)                                                  JCK44000
00674     441*          GP = A54*(A17-A30+A25)+DYP*((A36-A37+G2*(A38-A16))+A65*(A43-A39)) JCK44100
00675     442*          A50 = VLYM*PLYMI                                                     JCK44200
00676     443*          A41 = VLYM*A50                                                       JCK44300
00677     444*          A42 = PLYM*PLYM                                                      JCK44400
00700     445*          A23 = G2*(PLB+PLYM)                                                  JCK44500
00701     446*          GM = A54*(A25+A18-A31)+DYM*((A37-A41+G2*(A16-A42))+A23*(A39-A79)) JCK44600
00702     447*          A55 = A54+A54                                                        JCK44700
00703     448*          A5 = A12-A28                                                         JCK44800
00704     449*          A56 = A3-A29                                                         JCK44900
00705     450*          A57 = A56+A56                                                        JCK45000
00706     451*          A26 = G2*PLB                                                         JCK45100
00707     452*          A24 = A21-A78                                                        JCK45200
00707     453*    C     FIRST ORDER TERM OF U VELOCITY COMPONENT                             JCK45300
00710     454*          B1 = DI*(A55*(A5+G2*A58)+A57*A6+A26*A1*A24)                          JCK45400
00711     455*          A71 = VLXYP-VLXPYM                                                   JCK45500
00712     456*          A59 = VLYP-VLYM                                                      JCK45600
00713     457*          A4 = A14*PLBI                                                        JCK45700
00714     458*          A13 = (ULXP-ULB)*DXPI(I)+A56*(A71+A59)                               JCK45800
00714     459*    C     PART OF SECOND ORDER TERM OF U VELOCITY COMPONENT                    JCK45900
00715     460*          B2P = (A10+A11)*FP+A13*(A33-0.5*(A12*PLXPI+A4))                      JCK46000
00716     461*          A72 = VLXMYP-VLXYM                                                   JCK46100
00717     462*          A44 = (ULB-ULXM)*DXPI(I-1)+A56*(A59+A72)                             JCK46200
00717     463*    C     PART OF SECOND ORDER TERM OF U VELOCITY COMPONENT                    JCK46300
00720     464*          B2M = (A11+A8)*FM+A44*(A40-0.5*(A4+A8*A8))                           JCK46400
00721     465*          A27 = PLXYP*PLXYP                                                    JCK46500
00722     466*          A62 = PLXMYP*PLXMYP                                                  JCK46600
00723     467*          A43 = A11*VLB                                                        JCK46700
00724     468*          A73 = ULXYP-ULXMYP                                                   JCK46800
00725     469*          A67 = ULXP-ULXM                                                      JCK46900
00726     470*          A15 = (VLYP-VLB)*DYP+A54*(A73+A67)                                   JCK47000
00726     471*    C     PART OF SECOND ORDER TERM OF U VELOCITY COMPONENT                    JCK47100
00727     472*          B3P = 0.5*((A7+A45)*(A54*(A46*ULXYP-A47*ULXMYP+A5+G2*(A27-A62+A58)JCK47200
00727     473*         1)+DYP*(A19-A48)+A65+A54*(A75-A77+A24))+(A49+A11)*GP-(A19*PLYPI+A43JCK47300
00727     474*         2*PLBI)*A15)                                                          JCK47400
00730     475*          A61 = PLXPYM*PLXPYM                                                  JCK47500
00731     476*          A66 = PLXYM*PLXYM                                                    JCK47600
00732     477*          A64 = A42*PLBI                                                       JCK47700
00733     478*          A74 = ULXPYM-ULXYM                                                   JCK47800
00734     479*          A32 = DYM*(VLB-VLYM)+A54*(A67+A74)                                   JCK47900
```

```
00734   C     PART OF SECOND ORDER TERM OF U VELOCITY COMPONENT
00735         B3P = 0.5*((A45+A50)*(A54*(A5+A51*ULXPYM-A52*ULXYM+G2*(A58+A61-A63
00735        1))+JYM*(A48-A20)+A23*A54*(A24+A76-A80))+(A11+A53)*GM-(A64+A20*PLYM
00735        2I)*A32)
00736         A70 = A36-A41
00737         A66 = A38-A42
00740         A69 = A43-A79
00740   C     FIRST ORDER TERM OF V VELOCITY COMPONENT
00741         C1 = DT*(A55*A25+A57*(A70+G2*A68)+A26*A2*A69)
00741   C     PART OF SECOND ORDER TERM OF V VELOVITY COMPONENT
00742         C2P = 0.5*((VLXP*PLXPI+A45)*FP+(A10+A11)*(DXPI(I)*(A34-A48)+A56*(V
00742        1LXYP*VLXYP*PLXYPI-VLXPYM*VLXPYM*PXPYMI+A70+G2*(A27-A61+A68))+A33*A
00742        256*(A75-A76+A69))-(A34*PLXPI+A64)*A13)
00742   C     PART OF SECOND ORDER TERM OF V VELOCITY COMPONENT
00743         C2M = 0.5*((A45+VLXM*PLXMI)*FM+(A11+A8)*(DXPI(I-1)*(A48-A8*VLXM)+A
00743        156*(A70+VLXMYP*VLXMYP*PXMYPI-VLXYM*VLXYM*PLXYMI+G2*(A68+A62-A63))+
00743        2A48*A56*(A69+A77-A80))-(A64+A35*PLXMI)*A44)
00744         A66 = A45*A45
00744   C     PART OF SECOND ORDER TERM OF V VELOCITY COMPONENT
00745         C3P = (A7+A45)*GP+A15*(A65-0.5*(A7*A7+A66))
00745   C     PART OF SECOND ORDER TERM OF V VELOCITY COMPONENT
00746         C3M = (A45+A50)*GM+A32*(A23-0.5*(A66+A50*A50))
00747         A60 = A55*A67+A57*A59
00747   C     U VELOCITY COMPONENT
00750         ULQ(J13) = ULQ(J12)-B1+A9*(A1*(B2P-B2M)+A2*(B3P-B3M)+G1*DELXI(I)*A
00750        124*A60)
00750   C     V VELOCITY COMPONENT
00751         VLQ(J13) = VLQ(J12)-C1+A9*(A1*(C2P-C2M)+A2*(C3P-C3M)+G1*DELY*A69*A
00751        160)
00751   C     PHI IN THE LOWER LAYER
00752         PLQ(J13) = PLQ(J12)-DT*A60+A9*(A1*(FP-FM)+A2*(GP-GM))
00752   C
00753     500 CONTINUE
00756     520 CONTINUE
00756   C
00756   C     SET UP BOUNDARY CONDITIONS - THE OUTER MOST ROWS AND COLUMNS ARE
00756   C     SET EQUAL TO THE SECOND TO OUTER MOST ROWS AND COLUMNS
00756   C
00757         DO 540 J=1,JL
00762         UL(1,J,KDIM) = UL(  2,J,KDIM)
00763         VL(1,J,KDIM) = VL(  2,J,KDIM)
00764         PL(1,J,KDIM) = PL(  2,J,KDIM)
00765         UL(LL,J,KDIM) = UL(LLM,J,KDIM)
00766         VL(LL,J,KDIM) = VL(LLM,J,KDIM)
00767         PL(LL,J,KDIM) = PL(LLM,J,KDIM)
00770     540 CONTINUE
00772         DO 560 I=1,LL
00775         UL(I,1,KDIM) = UL(I,  2,KDIM)
00776         VL(I,1,KDIM) = VL(I,  2,KDIM)
00777         PL(I,1,KDIM) = PL(I,  2,KDIM)
01000         UL(I,JL,KDIM) = UL(I,JLM,KDIM)
01001         VL(I,JL,KDIM) = VL(I,JLM,KDIM)
01002         PL(I,JL,KDIM) = PL(I,JLM,KDIM)
01003     560 CONTINUE
01003   C
01003   C               ***** END BOUNDARY CONDITION *****
01003   C
```

```
01003   C----- PUSH PARAMETERS DOWN STACK. -----                                JCK53700
01005         IF (ISM .EQ. ISMOTH) GO TO 600                                    JCK53800
01007         DO 580 I=1,IJDIM                                                  JCK53900
01007   C     CHECK FOR MINIMUM LAYER DEPTH                                     JCK54000
01012         IF (PLQ(I+IJDIM) .LT. ABLK) PLQ(I+IJDIM) = ABLK                   JCK54100
01014         ULQ(I) = ULQ(I+IJDIM)                                             JCK54200
01015         VLQ(I) = VLQ(I+IJDIM)                                             JCK54300
01016         PLQ(I) = PLQ(I+IJDIM)                                             JCK54400
01017         IF (PLQ(I) .GT. 20000.0) IFLAG = N                                JCK54500
01021     580 CONTINUE                                                          JCK54600
01023         GO TO 680                                                         JCK54700
01024     600 CONTINUE                                                          JCK54800
01025         B1 = 0.5*SS*(1.0-SS)                                              JCK54900
01026         C1 = SS*SS*0.25                                                   JCK55000
01027         DO 620 J=2,JLM                                                    JCK55100
01032         DO 620 I=2,LLM                                                    JCK55200
01035         UL(I,J,KDIM-1) = UL(I,J,KDIM)+B1*(UL(I+1,J,KDIM)+UL(I-1,J,KDIM)+ULJCK55300
01036        1(I,J+1,KDIM)+UL(I,J-1,KDIM)-4.0*UL(I,J,KDIM))+C1*(UL(I-1,J-1,KDIM)JCK55400
01035        2+UL(I-1,J+1,KDIM)+UL(I+1,J-1,KDIM)+UL(I+1,J+1,KDIM)-4.0*UL(I,J,KDIJCK55500
01036        3M))                                                               JCK55600
01036         VL(I,J,KDIM-1) = VL(I,J,KDIM)+B1*(VL(I+1,J,KDIM)+VL(I-1,J,KDIM)+VLJCK55700
01036        1(I,J+1,KDIM)+VL(I,J-1,KDIM)-4.0*VL(I,J,KDIM))+C1*(VL(I-1,J-1,KDIM)JCK55800
01036        2+VL(I-1,J+1,KDIM)+VL(I+1,J-1,KDIM)+VL(I+1,J+1,KDIM)-4.0*VL(I,J,KDIJCK55900
01036        3M))                                                               JCK56000
01037         PL(I,J,KDIM-1) = PL(I,J,KDIM)+B1*(PL(I+1,J,KDIM)+PL(I-1,J,KDIM)+PLJCK56100
01037        1(I,J+1,KDIM)+PL(I,J-1,KDIM)-4.0*PL(I,J,KDIM))+C1*(PL(I-1,J-1,KDIM)JCK56200
01037        2+PL(I-1,J+1,KDIM)+PL(I+1,J-1,KDIM)+PL(I+1,J+1,KDIM)-4.0*PL(I,J,KDIJCK56300
01037        3M))                                                               JCK56400
01040         IF (PL(I,J,KDIM-1) .LT. ABLK) PL(I,J,KDIM-1) = ABLK               JCK56500
01042         IF (PL(I,J,KDIM-1) .GT. 20000.0) IFLAG = N                        JCK56600
01044     620 CONTINUE                                                          JCK56700
01047         DO 640 J=1,JL                                                     JCK56800
01052         UL(1,J,KDIM-1) = UL(  2,J,KDIM-1)                                 JCK56900
01053         VL(1,J,KDIM-1) = VL(  2,J,KDIM-1)                                 JCK57000
01054         PL(1,J,KDIM-1) = PL(  2,J,KDIM-1)                                 JCK57100
01055         UL(LL,J,KDIM-1) = UL(LLM,J,KDIM-1)                                JCK57200
01056         VL(LL,J,KDIM-1) = VL(LLM,J,KDIM-1)                                JCK57300
01057         PL(LL,J,KDIM-1) = PL(LLM,J,KDIM-1)                                JCK57400
01060     640 CONTINUE                                                          JCK57500
01062         DO 660 I=1,LL                                                     JCK57600
01065         UL(I,1,KDIM-1) = UL(I,  2,KDIM-1)                                 JCK57700
01066         VL(I,1,KDIM-1) = VL(I,  2,KDIM-1)                                 JCK57800
01067         PL(I,1,KDIM-1) = PL(I,  2,KDIM-1)                                 JCK57900
01070         UL(I,JL,KDIM-1) = UL(I,JLM,KDIM-1)                                JCK58000
01071         VL(I,JL,KDIM-1) = VL(I,JLM,KDIM-1)                                JCK58100
01072         PL(I,JL,KDIM-1) = PL(I,JLM,KDIM-1)                                JCK58200
01073     660 CONTINUE                                                          JCK58300
01075     680 CONTINUE                                                          JCK58400
01076         IF (IFLAG .GT. 0) GO TO 700                                       JCK58500
01076   C                                                                       JCK58600
01076   C----- OUTPUT UL, VL, PL, TL, AND TIME AT SELECTED TIME STEPS. -----    JCK58700
01100         IF (TIM .LT. PRINT(JPH)*60.0) GO TO 980                           JCK58800
01102         JPH = JPH+1                                                       JCK58900
01103         IF (ISKIP(1) .NE. 1) GO TO 860                                    JCK59000
01105     700 CONTINUE                                                          JCK59100
01106         IF (IFLAG .GT. 0) WRITE (6,2006) N                                JCK59200
01112         K = ISPC(1)                                                       JCK59300
```

```
      TIME = TIM*.2777777E-03                                       JCK59400
      LINES = 60                                                    JCK59500
      DO 850 J=1,JL                                                 JCK59600
      DO 840 I=1,LL                                                 JCK59700
      PLB = 1.0/PL(I,J,1)                                           JCK59800
      ULB = UL(I,J,1)*PLB                                           JCK59900
      VLB = VL(I,J,1)*PLB                                           JCK60000
      PLB = PL(I,J,1)+HG(I,J)                                       JCK60100
      UL(I,J,2) = ULB                                               JCK60110
      VL(I,J,2) = VLB                                               JCK60120
      PL(I,J,2) = PLB                                               JCK60130
      LINES = LINES+1                                               JCK60200
      VORT = 0.0                                                    JCK60300
      IF (I .EQ. 1.OR.J .EQ. 1) GO TO 760                           JCK60400
      IF (I .EQ. LL.OR.J .EQ. JL) GO TO 760                         JCK60500
      VLXP = VL(I+1,J,1)/PL(I+1,J,1)                                JCK60600
      VLXM = VL(I-1,J,1)/PL(I-1,J,1)                                JCK60700
      ULYP = UL(I,J+1,1)/PL(I,J+1,1)                                JCK60800
      ULYM = UL(I,J-1,1)/PL(I,J-1,1)                                JCK60900
      VORT = (VLXP-VLXM)*DELXI(I)-(ULYP-ULYM)*DELYJ(J)              JCK61000
  760 IF (LINES .LT. 58) GO TO 800                                  JCK61100
      LINES = 6                                                     JCK61200
      WRITE (6,2007) N,TIME                                         JCK61300
      IF (ISKIP(4) .EQ. 1.OR.ISKIP(4) .EQ. 3) GO TO 780             JCK61400
      WRITE (6,2008) K                                              JCK61500
      GO TO 800                                                     JCK61600
  780 WRITE (6,2009) K                                              JCK61700
  800 IF (ISKIP(4) .EQ. 0.OR.ISKIP(4) .EQ. 2) GO TO 820             JCK61800
      CALL UVDIR(ULB,VLB)                                           JCK61900
  820 WRITE (6,2005) I,J,X(I),Y(J),ULB,VLB,PLB,VORT                 JCK62000
  840 CONTINUE                                                      JCK62100
      LINES = 60                                                    JCK62200
  850 CONTINUE                                                      JCK62300
  860 CONTINUE                                                      JCK62400
      IF (IFLAG .GT. 0) GO TO 900                                   JCK62500
      IF (ITAG1 .NE. 1) GO TO 880                                   JCK62600
C     WRITE UL,VL AND PL TO OUTPUT TAPE                             JCK62700
      ISAVE(JPR-1) = N                                              JCK62800
      TSAVE(JPR-1) = TIM/60.0                                       JCK62900
      CALL OUTPT(IUNIT,IJDIM,ULG(IJDIM+1),NOGO)                     JCK63000
      IF (NOGO .EQ. 1) GO TO 900                                    JCK63100
      CALL OUTPT(IUNIT,IJDIM,VLG(IJDIM+1),NOGO)                     JCK63200
      IF (NOGO .EQ. 1) GO TO 900                                    JCK63300
      CALL OUTPT(IUNIT,IJDIM,PLG(IJDIM+1),NOGO)                     JCK63400
      IF (NOGO .EQ. 1) GO TO 900                                    JCK63500
      IRECG = IRECG+1                                               JCK63600
  880 CONTINUE                                                      JCK63700
C     CHECK FOR LAST TIME STEP                                      JCK63800
      IF (TIM .LT. STOP*60.0) GO TO 400                             JCK63900
C                                                                   JCK64000
  900 IF (ITAG1 .NE. 1) GO TO 920                                   JCK64100
      CALL NTRAN(IUNIT,22,9,22)                                     JCK64200
      WRITE (6,2010) MOUT(1),IRECG                                  JCK64300
      IF (IRECG .GT. 0) WRITE (6,2011) (ISAVE(I),TSAVE(I),I=1,IRECG) JCK64400
      WRITE (6,2012) (MOUT(I),I=3,10)                               JCK64500
      IF (ISKIP(3) .EQ. 1) WRITE (6,2013)                           JCK64600
      WRITE (6,2014) IUNIT                                          JCK64700
```

```
01266  651*       920 CONTINUE                                                          JCK64800
01267  652*      1000 CONTINUE                                                          JCK64900
01271  653*      2000 FORMAT ('1',28X,'**** THIS OUTPUT IS FROM THE WSMR WIND FIELD TERRJCK65000
01271  654*          1AIN ADJUSTMENT MODEL ****'//)                                    JCK65100
01272  655*      2001 FORMAT (49X,'** PROGRAM INITIALIZATION DATA **'/                  JCK65200
01272  656*          15X,'IDIM (X DIMENSION) =',I3,', JDIM (Y DIMENSION) =',I3,', LL (NOJCK65300
01272  657*          2, PNTS IN X AXIS) =',I3,', JL (NO. PNTS. IN Y AXIS) =',I3/       JCK65400
01272  658*          35X,'ABLK (MIN LAYER DEPTH) =',F8.3,', ULT (U WIND SPD COMPONENT) =JCK65500
01272  659*          4',F8.4,', VLT (V WIND SPD COMPONENT) =',F8.3/                    JCK65600
01272  660*          55X,'PLT (LAYER HEIGHT) =',F9.3,', ISMOTH (FILTER STEP NO.) =',I3,'JCK65700
01272  661*          6, NCNT (TIME STEP RECALC NO.) =',I3/5X,'DT (INITIAL TIME STEP INC)JCK65800
01272  662*          7 =',E12.6,', DTLMDA (STABILITY FACTOR) =',F5.3,', G1 (REDUCED GRAVJCK65900
01272  663*          8ITY FACTOR) =',F7.4/5X,'PRINT (OUTPUT ARRAY) =',11(F8.3,',')/27X,9JCK66000
01272  664*          9(F8.3,','))/5X,'ISKIP (OPTION ARRAY) =',10(I3,',')               JCK66100
01273  665*      2002 FORMAT ('1',36X,'** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN JCK66200
01273  666*          1HEIGHTS **')                                                     JCK66300
01274  667*      2003 FORMAT (A1,4X,'X INDEX  Y INDEX   X COORDINATE  Y COORDINATE  U CJCK66400
01274  668*          1OMPONENT   V COMPONENT    LAYER HEIGHT   TERRAIN HEIGHT'/8X,'I',8XJCK66500
01274  669*          2,'J',8X,'(METERS)',6X,'(METERS)',5X,'(METERS/SEC)  (METERS/SEC)  JCK66600
01274  670*          3 (METERS)',8X,'(METERS)'/1X,65('--'))                            JCK66700
01275  671*      2004 FORMAT (A1,4X,'X INDEX  Y INDEX   X COORDINATE  Y COORDINATE   WINJCK66800
01275  672*          1D SPEED     DIRECTION     LAYER HEIGHT   TERRAIN HEIGHT'/8X,'I',8XJCK66900
01275  673*          2,'J',8X,'(METERS)',6X,'(METERS)',4X,'(METERS/SEC)    (DEGREES)',6XJCK67000
01275  674*          3,'(METERS)',8X,'(METERS)'/1X,65('--'))                           JCK67100
01276  675*      2005 FORMAT (7X,I3,6X,I3,5X,F12.3,2X,F12.3,4X,F9.4,5X,F9.4,5X,F10.4,5X,JCK67200
01276  676*          1E12.6)                                                           JCK67300
01277  677*      2006 FORMAT ('0',5X,'**** PROBLEM GROWING UNSTABLE, PROGRAM PRINTS    JCK67400
01277  678*          1ENT TIME STEP (',I4,') AND STOPS ****'/)                         JCK67500
01300  679*      2007 FORMAT ('1',24X,'** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIMJCK67600
01300  680*          1E STEP ',I4,' (',F9.5,' HOURS) **')                              JCK67700
01301  681*      2008 FORMAT (A1,4X,'X INDEX  Y INDEX   X COORDINATE  Y COORDINATE  U CJCK67800
01301  682*          1OMPONENT   V COMPONENT    LAYER HEIGHT   VORTICITY'/8X,'I',8X,'J',JCK67900
01301  683*          28X,'(METERS)      (METERS)     (METERS/SEC)  (METERS/SEC)    (METEJCK68000
01301  684*          3RS)'/1X,64('--'))                                               JCK68100
01302  685*      2009 FORMAT (A1,4X,'X INDEX  Y INDEX   X COORDINATE  Y COORDINATE   WINJCK68200
01302  686*          1D SPEED     DIRECTION     LAYER HEIGHT   VORTICITY'/8X,'I',8X,'J',JCK68300
01302  687*          28X,'(METERS)      (METERS)     (METERS/SEC)  (DEGREES)      (METEJCK68400
01302  688*          3RS)'/1X,64('--'))                                               JCK68500
01303  689*      2010 FORMAT ('1',51X,'** OUTPUT TAPE INFORMATION **'//               JCK68600
01303  690*          15X,'NUMBER OF TIMES OUTPUT OF THE U AND V WIND COMPONENTS AND LAYEJCK68700
01303  691*          2R HEIGHT ARE DESIRED =',I4/                                     JCK68800
01303  692*          35X,'NUMBER OF TIMES OUTPUT OF THE U AND V WIND COMPONENTS AND LAYEJCK68900
01303  693*          4R HEIGHT WAS COMPLETED =',I4)                                   JCK69000
01304  694*      2011 FORMAT (5X,'TIME STEP NUMBER AND TIME (MINUTES) OF EACH OUTPUT'//2JCK69100
01304  695*          10X,5(' (',I4,',',F8.4,'),'))                                    JCK69200
01305  696*      2012 FORMAT (5X,'SIZE OF I DIMENSION OF UL,VL,PL AND HG = ',I3/5X,'SIZEJCK69300
01305  697*          1 OF J DIMENSION OF UL,VL,PL AND HG = ',I3/5X,'NUMBER OF COORDINATEJCK69400
01305  698*          1S IN X AXIS (IN IDIM) = ',I3/5X,'NUMBER OF COORDINATES IN Y AXIS (JCK69500
01305  699*          2IN JDIM) = ',I3/5X,'INDEX OF THE BEGINNING COORDINATE ON THE X AXIJCK69600
01305  700*          3S OF UNIFORM GRID SPACING = ',I3/                               JCK69700
01305  701*          45X,'INDEX OF THE ENDING COORDINATE ON THE X AXIS OF UNIFORM GRID SJCK69800
01305  702*          5PACING = ',I3/                                                  JCK69900
01305  703*          65X,'INDEX OF THE BEGINNING COORDINATE ON THE Y AXIS OF UNIFORM GRIJCK70000
01305  704*          7D SPACING = ',I3/                                               JCK70100
01305  705*          85X,'INDEX OF THE ENDING COORDINATE ON THE Y AXIS OF UNIFORM GRID SJCK70200
01305  706*          9PACING = ',I3/)                                                 JCK70300
01306  707*      2013 FORMAT (5X,'TERRAIN HEIGHTS WERE WRITTEN TO TAPE')              JCK70400
```

```
01307    700*      2010 FORMAT ('0TAPE OUTPUT WAS WRITTEN TO UNIT',I3)
01310    709*           RETURN
01311    710*           END
```

JCK70500
JCK70600
JCK70700

END OF COMPILATION: NO DIAGNOSTICS.

```
OPUF,Is MOUTHR
FOR 01uL-00/07/73-14:03:25 (,,)

   SUBROUTINE MOUTHR    ENTRY POINT 000651

   STORAGE USED: CODE(1) 000702 DATA(0) 000111 BLANK COMMON(2) 000000

    COMMON BLOCKS:

    00u3   DIM     000003

   EXTERNAL REFERENCES (BLOCK, NAME)

    00u4   WRDUS
    00u5   WIO1S
    00u6   WIO2S
    00u7   WERR3S

   STORAGE ASSIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    00u1    000125 1168      00u1   000132 1226      0001   000137 127G      0001   000166 1376      0001   000167 1426
    0001    000217 1528      0001   000220 155G      0000   000021 2000F     0000   000023 2001F     0001   000402 2026
    00u1    000413 2068      0001   000456 217G      0001   000467 223G      0001   000531 2346      0001   000540 2406
    00u1    000601 2516      00u1   000610 255G      0000 I 000006 I         0003 I 000000 IDIM      0000 I 000015 IL
    00u0 I  000010 IM1       0000 I 000011 IM2       0000 I 000012 IM3       0000 I 000013 IM4       0000 I 000001 IND
    00u0    000030 INJPS     0000 I 000020 IR        0000 I 000017 IS        0000 I 000000 IST       0000 I 000005 J
    0003 I  000001 JDIM      0000 I 000003 JND       0000 I 000002 JST       0000 I 000007 LLM       0003   000002 NP
    00u0 R  000004 XMIN      0000 R 000014 XM1       0000 R 000016 XM2


00101      1e          SUBROUTINE MOUTHR(HG,LL,JL,X,Y)                                  MTR00100
00103      2e          COMMON/DIM/IDIM,JDIM,NP                                          MTR00200
00104      3e          DIMENSION X(LL),Y(JL)                                            MTR00300
00105      4e          DIMENSION HG(IDIM,JDIM)                                          MTR00400
00105      5e     C    THIS SUBROUTINE READS THE TERRAIN DATA INTO A CENTRAL            MTR00500
00105      6e     C         AREA OF THE GRID SYSTEM DEFINED BY IST,IND,JST,JND          MTR00600
00105      7e     C    THE AREA OUTSIDE OF THE ABOVE AREA IS FILLED WITH TERRAIN        MTR00700
00105      8e     C    HEIGHTS THAT ARE REDUCED TO THE MINIMUM HEIGHT AS A FUNCTION OF  MTR00800
00105      9e     C    DISTANCE FROM THE EDGE OF THE INPUT AREA                         MTR00900
00105     10e     C    INPUT STARTING AND ENDING INDICES (OF THE TERRAIN) ON THE X      MTR01000
00105     11e     C         AXIS ARE (IST,IND)                                          MTR01100
00105     12e     C     INPUT STARTING AND ENDING INDICES ON THE Y AXIS ARE (JST,JND)   MTR01200
00106     13e          READ (5,2001) IST,IND,JST,JND                                    MTR01300
00106     14e     C    INPUT TERRAIN                                                    MTR01400
00110     15e          XMIN = 1.0E5                                                     MTR01500
00115     16e          DO 20 J=JST,JND                                                  MTR01600
00120     17e          READ (5,2000) (HG(I,J),I=IST,IND)                                MTR01700
00126     18e          DO 20 I=IST,IND                                                  MTR01800
00131     19e          IF (HG(I,J) .LT. XMIN) XMIN = HG(I,J)                            MTR01900
00134     20e       20 CONTINUE                                                         MTR02000
00137     21e     C    SET THREE OUTER MOST ROWS AND COLUMNS EQUAL TO THE MINIMUM FOR A MTR02100
```

```
00133   C     FLAT OUTER BOUNDARY                                              MTR02200
00136         DO 30 I=1,3                                                      MTR02300
00141         DO 30 J=1,JL                                                     MTR02400
00144         HG(I,J) = XMIN                                                   MTR02500
00145      30 HG(I+LL-3,J) = XMIN                                              MTR02600
00150         LL4 = LL-3                                                       MTR02700
00151         DO 40 I=4,LL4                                                    MTR02800
00154         DO 40 J=1,3                                                      MTR02900
00157         HG(I,J) = XMIN                                                   MTR03000
00160      40 HG(I,J+JL-3) = XMIN                                              MTR03100
00163   C     CALCULATE HEIGHTS FROM THE THIRD ROW OR COLUMN IN TO THE SIXTH   MTR03200
00160   C     ROW OR COLUMN OR UNTIL THE INPUT AREA IS REACHED BY INTERPOLATION MTR03300
00160   C     BETWEEN THE MINIMUM AND THE INTERIOR TERRAIN HEIGHT TO PROVIDE A MTR03400
00160   C     SMOOTH SLOPE FROM TERRAIN TO BOUNDARY                            MTR03500
00163         IM1 = 6                                                          MTR03600
00164         IF (IST .GT. 6) IM1 = IST                                        MTR03700
00166         IM2 = 6                                                          MTR03800
00167         IF (JST .GT. 6) IM2 = JST                                        MTR03900
00171         IM3 = LL-5                                                       MTR04000
00172         IF (IND .LT. IM3) IM3 = IND                                      MTR04100
00174         IM4 = JL-5                                                       MTR04200
00175         IF (JND .LT. IM4) IM4 = JND                                      MTR04300
00177         XM1 = 1.0/(X(IM1)-X(3))                                          MTR04400
00200         IL = IM1-1                                                       MTR04500
00201         DO 50 I=4,IL                                                     MTR04600
00204         XM2 = (X(I)-X(3))*XM1                                            MTR04700
00205         DO 50 J=IM2,IM4                                                  MTR04800
00210      50 HG(I,J) = (HG(IM1,J)-XMIN)*XM2+XMIN                              MTR04900
00213         XM1 = 1.0/(X(LL-2)-X(IM3))                                       MTR05000
00214         IL = LL-3                                                        MTR05100
00215         IS = IM3+1                                                       MTR05200
00216         DO 60 I=IS,IL                                                    MTR05300
00221         XM2 = (X(LL-2)-X(I))*XM1                                         MTR05400
00222         DO 60 J=IM2,IM4                                                  MTR05500
00225      60 HG(I,J) = (HG(IM3,J)-XMIN)*XM2+XMIN                              MTR05600
00230         XM1 = 1.0/(Y(IM2)-Y(3))                                          MTR05700
00231         IL = IM2-1                                                       MTR05800
00232         IR = LL-3                                                        MTR05900
00233         DO 70 J=4,IL                                                     MTR06000
00236         XM2 = (Y(J)-Y(3))*XM1                                            MTR06100
00237         DO 70 I=4,IR                                                     MTR06200
00242      70 HG(I,J) = (HG(I,IM2)-XMIN)*XM2+XMIN                              MTR06300
00245         XM1 = 1.0/(Y(JL-2)-Y(IM4))                                       MTR06400
00246         IL = JL-3                                                        MTR06500
00247         IS = IM4+1                                                       MTR06600
00250         DO 80 J=IS,IL                                                    MTR06700
00253         XM2 = (Y(JL-2)-Y(J))*XM1                                         MTR06800
00254         DO 80 I=4,IR                                                     MTR06900
00257      80 HG(I,J) = (HG(I,IM4)-XMIN)*XM2+XMIN                              MTR07000
00262    2000 FORMAT (1H ,10F6.1)                                              MTR07100
00263    2001 FORMAT (6I4)                                                     MTR07200
00264         RETURN                                                           MTR07300
00265         END                                                              MTR07400
```

END OF COMPILATION: NO DIAGNOSTICS.

```
@FOR,IS OUTPT
FOR 010L-06/07/75-14:03:28 (,0)

   SUBROUTINE OUTPT      ENTRY POINT 000117

   STORAGE USED: CODE(1) 000141; DATA(0) 000057; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003   NTRAN
    0004   NWDUS
    0005   NIO2S
    0006   NERR3S

   STORAGE ASSIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    0001   000002 10L      0001   000011 20L      0000   000002 2000F     0000   000015 2001F     0000   000032 2002F
    0001   000041 30L      0001   000063 40L      0001   000106 50L       0001   000110 60L       0000   000052 INJP$
    0000 I 000001 ISTS     0000 I 000000 ITRY

00101            SUBROUTINE OUTPT(IUNIT,NWRD,ARRAY,NOGO)                    OPT00100
00103            DIMENSION ARRAY(NWRD)                                      OPT00200
00103       C    THIS SUBROUTINE OUTPUTS VIA NTRAN ALL TAPE DATA            OPT00300
00104            ITRY = 0                                                   OPT00400
00105            NOGO = 0                                                   OPT00500
00106         10 CALL NTRAN(IUNIT,1,NWRD,ARRAY,ISTS)                        OPT00600
00107         20 CONTINUE                                                   OPT00700
00110            IF (ISTS .EQ. -1) GO TO 20                                 OPT00800
00112            IF (ISTS .GT. 0) GO TO 60                                  OPT00900
00114            IF (ISTS .EQ. -2) GO TO 30                                 OPT01000
00116            IF (ISTS .EQ. -3) GO TO 40                                 OPT01100
00120            WRITE (6,2000) ISTS,IUNIT                                  OPT01200
00124            GO TO 50                                                   OPT01300
00125         30 CALL NTRAN(IUNIT,22,7,-1,9,11)                             OPT01400
00126            WRITE (6,2001) IUNIT                                       OPT01500
00131            IUNIT = IUNIT+1                                            OPT01600
00132            GO TO 10                                                   OPT01700
00133         40 CALL NTRAN(IUNIT,22,7,-1)                                  OPT01800
00134            ITRY = ITRY+1                                              OPT01900
00135            IF (ITRY .LT. 5) GO TO 10                                  OPT02000
00137            WRITE (6,2002) IUNIT                                       OPT02100
00142         50 NOGO = 1                                                   OPT02200
00143         60 RETURN                                                     OPT02300
00144       2000 FORMAT ('0*****  UNKNOWN TAPE STATUS CODE ',I4,', TAPE UNIT ',I2/) OPT02400
00145       2001 FORMAT ('0*****  HAVE WRITTEN FULL REEL ON UNIT ',I2,', UNLOAD FOR OPT02500
00145           1NEXT REEL')                                                OPT02600
00146       2002 FORMAT ('0*****  HARDWARE OR PARITY ERROR ON UNIT ',I2)    OPT02700
00147            END                                                        OPT02800
```

[illegible] OF COMPILATION [illegible] DIAGNOSTICS.

```
@FOR,I3 MISC
FOR 01UL-08/07/73-14:05:29 (,0)

   SUBROUTINE MISC      ENTRY POINT 000100

   STORAGE USED: CODE(1) 000126; DATA(0) 000024; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003   WERR35

   STORAGE ASSIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    0001   000020 1116      0001   000032 20L       0001   000036 21L       0001   000046 40L       0001   000051 50L
    0001   000065 60L       0000 R 000003 DIF       0000 I 000002 I         0000   000006 INJPS     0000 R 000000 XLST
    0000 R 000001 AMIN


00101      1*           SUBROUTINE MISC(IJST,IJND,XY,LLJL,LLJLM)                                  MSC00100
00101      2*     C     THIS SUBROUTINE DETERMINES THE STARTING AND ENDING INDICES (IJST          MSC00200
00101      3*     C     AND IJND) OF THE AREA ON THE X OR Y AXIS OF UNIFORM GRID SPACING          MSC00300
00103      4*           DIMENSION XY(LLJL)                                                        MSC00400
00104      5*           IJND = 0                                                                  MSC00500
00105      6*           IJST = 0                                                                  MSC00600
00106      7*           XLST = 1.0E6                                                              MSC00700
00107      8*           XMIN = 1.0E5                                                              MSC00800
00110      9*           DO 50 I=1,LLJLM                                                           MSC00900
00113     10*           DIF = XY(I+1)-XY(I)                                                       MSC01000
00114     11*           IF (DIF-XMIN) 21,20,10                                                    MSC01100
00117     12*      10   IJND = I                                                                  MSC01200
00120     13*           GO TO 60                                                                  MSC01300
00121     14*      20   IF (IJST .GT. 0) GO TO 50                                                 MSC01400
00123     15*      21   XMIN = DIF                                                               MSC01500
00124     16*           IJST = I                                                                  MSC01600
00125     17*           IF (XMIN-XLST) 30,40,30                                                   MSC01700
00130     18*      30   XLST = XMIN                                                              MSC01800
00131     19*           GO TO 50                                                                  MSC01900
00132     20*      40   IJST = I-1                                                               MSC02000
00133     21*      50   CONTINUE                                                                 MSC02100
00135     22*           IF (IJST .EQ. 0) IJST = 1                                                 MSC02200
00137     23*           IF (IJND .EQ. 0) IJND = LLJL                                              MSC02300
00141     24*      60   RETURN                                                                   MSC02400
00142     25*           END                                                                       MSC02500

   END OF COMPILATION:        NO DIAGNOSTICS.
```

```
@FOR,IS UVDIR
FOR 01LL-06/07/73-14:03:34 (,0)

   SUBROUTINE UVDIR     ENTRY POINT 000042

   STORAGE USED: CODE(1) 000050; DATA(0) 000012; BLANK COMMON(2) 000000

   EXTERNAL REFERENCES (BLOCK, NAME)

    0003   ATAN2
    0004   SQRT
    0005   NERR3$

   STORAGE ASSIGNMENT  (BLOCK, TYPE, RELATIVE LOCATION, NAME)

    0000 R 000001 DIR       0000   000004 INJP$     0000 R 000000 RAD


00101      1*              SUBROUTINE UVDIR(X,Y)                                         UVD00100
00101      2*        C     THIS SUBROUTINE CONVERTS THE U AND V COMPONENTS (X AND Y) OF THE UVD00200
00101      3*        C     WIND SPEED INTO WIND SPEED AND DIRECTION (X AND Y)            UVD00300
00103      4*              DATA RAD/57.29582/                                            UVD00400
00105      5*              DIR = 270.0-ATAN2(Y,X)*RAD                                    UVD00500
00106      6*              IF (DIR .GE. 360.0) DIR = DIR-360.0                           UVD00600
00110      7*              X = SQRT(X*X+Y*Y)                                             UVD00700
00111      8*              Y = DIR                                                       UVD00800
00112      9*              RETURN                                                        UVD00900
00113     10*              END                                                           UVD01000

     END OF COMPILATION:       NO  DIAGNOSTICS.
```

QMAP,I
MAP 0017-06/11-11:27

ADDRESS LIMITS 001000 023170 040000 113044
STARTING ADDRESS 021575

WORDS DECIMAL 9337 IBANK 22053 DBANK

SEGMENT MAIN		001000	023170		040000	113044
NSWTCS/FOR	1	001000	001021			
NRBLKS/FOR64	1	001022	001044			
NRWNDS/FOR64	1	001045	001124	2	040000	040011
NWEFS/FOR64	1	001125	001326	2	040012	040031
NBDCVS/FOR64	1	001327	001454	2	040032	040074
NFTVS/FOR	1	001455	001477			
NFTCHS/FOR64	1	001500	001767	2	040075	040132
NCLOSS/FOR64	1	001770	002143	2	040133	040163
NWBLKS/FOR64	1	002144	002205			
NBSBLS/FOR64	1	002206	002322			
NWPDAS/FOR64	1	002323	002355			
NBFOUS/FOR				2	040164	042365
NINPTS/FOR64	1	002356	003236	2	042366	042411
NIRECS/UUC067				0	042412	042465
NOTINS/FOR64	1	003237	003533	2	042466	042471
NOUTS/FOR64	1	003534	004536	2	042472	042520
NFMTS/FOR64	1	004537	005406	2	042521	042575
NCNVTS/FOR64	1	005407	005626	2	042576	042672
NIDERS/FOR64	1	005627	005762	2	042673	042776
NININS/FOR64	1	005763	006160	2	042777	043012
NFCHKS/FOR64	1	006161	007040	2	043013	043150
				4	043151	043222
ERUS/67-02						
NTABS/UUCC				2	043223	043322
ATANS/FOR59	1	007041	007244	2	043323	043354
NIDUFS/FOR64	1	007245	007310	2	043355	043355
HSKONITOR/HHLP	1	007311	010350	2	043356	044100
NERRS/FOR64	1	010351	010734	2	044101	044257
NIERS/FOR64	1	010735	011034	2	044260	044321
NOLUFS/FOR64	1	011035	011101			
SWITS/FOR59	1	011102	011142	2	044322	044333
SINCOSS/FOR59	1	011143	011275	2	044334	044355
NLINPS/FOR64	1	011276	013011	2	044355	044541
NTRANS/FOR64	1	013012	014205	2	044542	045172
DI- (COMMON BLOCK)					045173	045175
BLANKSCOMMON (COMMON BLOCK)						
JACK	1	014206	021574	0	045176	047456
	5	[illegible]		2	BLANKSCOMMON	

MUUEL	1	021570 021721	0	047457 112616
	3	DIM	2	BLANKSCOMMON
UVDIR	1	021722 021777	0	112617 112630
			2	BLANKSCOMMON
MISC	1	022000 022145	0	112631 112654
			2	BLANKSCOMMON
OUTPT	1	022120 022200	0	112655 112733
			2	BLANKSCOMMON
MUUTNR	1	022207 023170	0	112734 113044
	3	DIM	2	BLANKSCOMMON

SYSSORLIBB. LEVEL 07-02
END OF COLLECTION - TIME 1.052 SECONDS

APPENDIX C

COMPUTER PROGRAM EXAMPLE PROBLEM OUTPUT LISTING

The computer program output listing as shown here has several pages of output omitted because of the volume of the listing. Only important sections have been retained.

The first page of output gives all of the program initial input data except for the x and y axes and terrain heights. Pages C-3 through C-18 (computer listing pages 25 to 40) give the initial wind field, layer height and terrain values up to a J index of 16. This part of the listing was included by setting ISKIP(1) equal to 1. Also, by setting ISKIP(4) = 1, the program has printed the wind speed and direction rather than the u and v components. Pages C-19 through C-34 (computer listing pages 66 to 81) show a printout of the 79th time step at 3 hours up to a J index of 16. The listing was produced by setting ISKIP(1) equal to 1. This part of the listing gives the x and y coordinates, the wind speed and direction, the layer height and the vorticity, where vorticity is a measure of the rotation of the wind in units of sec^{-1}. Pages C-35 through C-50 (computer listing pages 107 through 122) printout of the 131st time step at 5 hours up to a J index of 16. This part of the listing has the same form as that given above for time step 79. This part of the listing also represents the final solution as the greatest time value input was 5 hours. Page C-51 (computer listing page 148) gives a summary of the contents of the output tape requested. The summary shows that output from two time steps (79 and 131) was desired and that both were written to tape. The listing then prints the time step and number of model seconds. The listing then shows the maximum index values of each output array and then gives the indices of the grid area of uniform spacing. Also, the summary shows the terrain height data were written to tape and the output tape was unit 1.

**** THIS OUTPUT IS FROM THE WSMR WIND FIELD TERRAIN ADJUSTMENT MODEL ****

** PROGRAM INITIALIZATION DATA **

IDIM (X DIMENSION) = 41, JDIM (Y DIMENSION) = 41, LL (NO. PNTS IN X AXIS) = 41, JL (NO. PNTS. IN Y AXIS) = 41
AJLK (MIN LAYER DEPTH) = 50.000, ULT (U WIND SPD COMPONENT) = 7.0000, VLT (V WIND SPD COMPONENT) = 7.000
PLT (LAYER HEIGHT) = 2500.000, ISMTH (FILTER STEP NO.) = 5, NCNT (TIME STEP RECALC NO.) = 2
DT (INITIAL TIME STEP INC) = .1474800+03, DTLADA (STABILITY FACTOR) = .950, G1 (REDUCED GRAVITY FACTOR) = .1000
PHIN (OUTPUT ARRAY) = 180.000, 300.000, .000, .000, .000, .000, .000, .000, .000, .000, .000,
.000 .000, .000, .000, .000, .000, .000, .000, .000,
ISKIP (OPTION, ARRAY) = 1, 1, 1, 1, 0, 0, 0, 0, 0, 0,

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	1	100000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
2	1	160000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
3	1	200000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
4	1	300000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
5	1	320000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
6	1	330000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
7	1	335000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
8	1	340000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
9	1	345000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
10	1	350000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
11	1	355000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
12	1	360000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
13	1	365000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
14	1	370000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
15	1	375000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
16	1	380000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
17	1	385000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
18	1	390000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
19	1	395000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
20	1	400000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
21	1	405000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
22	1	410000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
23	1	415000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
24	1	420000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
25	1	425000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
26	1	430000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
27	1	435000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
28	1	440000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
29	1	445000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
30	1	450000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
31	1	455000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
32	1	460000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
33	1	465000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
34	1	470000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
35	1	475000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
36	1	480000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
37	1	490000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
38	1	510000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
39	1	500000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
40	1	520000.000	3340000.000	9.8995	225.0000	2800.0000	.115820+04
41	1	530000.000	3340000.001	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

I INDEX	J INDEX	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	2	100000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
2	2	150000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
3	2	200000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
4	2	300000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
5	2	350000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
6	2	400000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
7	2	450000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
8	2	500000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
9	2	550000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
10	2	600000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
11	2	650000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
12	2	700000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
13	2	750000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
14	2	800000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
15	2	850000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
16	2	900000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
17	2	950000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
18	2	1000000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
19	2	1050000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
20	2	1100000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
21	2	1150000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
22	2	1200000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
23	2	1250000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
24	2	1300000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
25	2	1350000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
26	2	1400000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
27	2	1450000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
28	2	1500000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
29	2	1550000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
30	2	1600000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
31	2	1650000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
32	2	1700000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
33	2	1750000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
34	2	1800000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
35	2	1850000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
36	2	1900000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
37	2	1950000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
38	2	2000000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
39	2	2050000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
40	2	2100000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04
41	2	2150000.000	3420000.000	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	3	100000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
2	3	150000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
3	3	200000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
4	3	250000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
5	3	300000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
6	3	350000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
7	3	400000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
8	3	450000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
9	3	500000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
10	3	550000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
11	3	600000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
12	3	650000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
13	3	700000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
14	3	750000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
15	3	800000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
16	3	850000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
17	3	900000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
18	3	950000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
19	3	1000000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
20	3	1050000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
21	3	1100000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
22	3	1150000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
23	3	1200000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
24	3	1250000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
25	3	1300000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
26	3	1350000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
27	3	1400000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
28	3	1450000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
29	3	1500000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
30	3	1550000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
31	3	1600000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
32	3	1650000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
33	3	1700000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
34	3	1750000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
35	3	1800000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
36	3	1850000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
37	3	1900000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
38	3	1950000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
39	3	2000000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
40	3	2050000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04
41	3	2100000.000	3500000.000	9.3995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

X Index I	Y Index J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	4	1.0000E+05	3.5400E+06	9.8995	225.0000	2800.0000	.11582E+04
2	4	1.5000E+05	3.5400E+06	9.8995	225.0000	2800.0000	.11582E+04
3	4	2.0000E+05	3.5400E+06	9.8995	225.0000	2800.0000	.11582E+04
4	4	2.5000E+05	3.5400E+06	9.8995	225.0000	2800.0000	.11701E+04
5	4	3.0000E+05	3.5400E+06	9.8995	225.0000	2800.0000	.11761E+04
6	4	3.5000E+05	3.5400E+06	9.8995	225.0000	2800.0000	.11791E+04
7	4	4.0000E+05	3.5400E+06	9.8995	225.0000	2800.0000	.11808E+04
8	4	4.5000E+05	3.5400E+06	9.8995	225.0000	2800.0000	.12139E+04
9	4	5.0000E+05	3.5400E+06	9.8995	225.0000	2800.0000	.12627E+04
10	4	5.5000E+05	3.5400E+06	9.8995	225.0000	2800.0000	.14368E+04
11	4	6.0000E+05	3.5400E+06	9.8995	225.0000	2800.0000	.17155E+04
12	4	6.5000E+05	3.5400E+06	9.8995	225.0000	2800.0000	.12662E+04
13	4	7.0000E+05	3.5400E+06	9.8995	225.0000	2800.0000	.12104E+04
14	4	7.5000E+05	3.5400E+06	9.8995	225.0000	2800.0000	.11643E+04
15	4	8.0000E+05	3.5400E+06	9.8995	225.0000	2800.0000	.11930E+04
16	4	8.5000E+05	3.5400E+06	9.8995	225.0000	2800.0000	.12017E+04
17	4	9.0000E+05	3.5400E+06	9.8995	225.0000	2800.0000	.12070E+04
18	4	9.5000E+05	3.5400E+06	9.8995	225.0000	2800.0000	.12087E+04
19	4	1.0000E+06	3.5400E+06	9.8995	225.0000	2800.0000	.12157E+04
20	4	1.0500E+06	3.5400E+06	9.8995	225.0000	2800.0000	.12505E+04
21	4	1.1000E+06	3.5400E+06	9.8995	225.0000	2800.0000	.12610E+04
22	4	1.1500E+06	3.5400E+06	9.8995	225.0000	2800.0000	.12941E+04
23	4	1.2000E+06	3.5400E+06	9.8995	225.0000	2800.0000	.13028E+04
24	4	1.2500E+06	3.5400E+06	9.8995	225.0000	2800.0000	.14421E+04
25	4	1.3000E+06	3.5400E+06	9.8995	225.0000	2800.0000	.14038E+04
26	4	1.3500E+06	3.5400E+06	9.8995	225.0000	2800.0000	.13672E+04
27	4	1.4000E+06	3.5400E+06	9.8995	225.0000	2800.0000	.13496E+04
28	4	1.4500E+06	3.5400E+06	9.8995	225.0000	2800.0000	.13324E+04
29	4	1.5000E+06	3.5400E+06	9.8995	225.0000	2800.0000	.13220E+04
30	4	1.5500E+06	3.5400E+06	9.8995	225.0000	2800.0000	.13045E+04
31	4	1.6000E+06	3.5400E+06	9.8995	225.0000	2800.0000	.13150E+04
32	4	1.6500E+06	3.5400E+06	9.8995	225.0000	2800.0000	.12671E+04
33	4	1.7000E+06	3.5400E+06	9.8995	225.0000	2800.0000	.12418E+04
34	4	1.7500E+06	3.5400E+06	9.8995	225.0000	2800.0000	.13271E+04
35	4	1.8000E+06	3.5400E+06	9.8995	225.0000	2800.0000	.13150E+04
36	4	1.8500E+06	3.5400E+06	9.8995	225.0000	2800.0000	.12261E+04
37	4	1.9000E+06	3.5400E+06	9.8995	225.0000	2800.0000	.12169E+04
38	4	1.9500E+06	3.5400E+06	9.8995	225.0000	2800.0000	.11970E+04
39	4	2.0000E+06	3.5400E+06	9.8995	225.0000	2800.0000	.11582E+04
40	4	2.0500E+06	3.5400E+06	9.8995	225.0000	2800.0000	.11582E+04
41	4	2.1000E+06	3.5400E+06	9.8995	225.0000	2800.0000	.11582E+04

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	5	1000.000	35000.000	9.8995	225.0000	2800.0000	.115820+04
2	5	1500.000	35000.000	9.8995	225.0000	2800.0000	.115820+04
3	5	2000.000	35000.000	9.8995	225.0000	2800.0000	.115820+04
4	5	2500.000	35000.000	9.8995	225.0000	2800.0000	.117613+04
5	5	3000.000	35000.000	9.8995	225.0000	2800.0000	.118509+04
6	5	3500.000	35000.000	9.8995	225.0000	2800.0000	.118957+04
7	5	4000.000	35000.000	9.8995	225.0000	2800.0000	.119223+04
8	5	4500.000	35000.000	9.8995	225.0000	2800.0000	.124186+04
9	5	5000.000	35000.000	9.8995	225.0000	2800.0000	.131497+04
10	5	5500.000	35000.000	9.8995	225.0000	2800.0000	.157623+04
11	5	6000.000	35000.000	9.8995	225.0000	2800.0000	.199426+04
12	5	6500.000	35000.000	9.8995	225.0000	2800.0000	.132020+04
13	5	7000.000	35000.000	9.8995	225.0000	2800.0000	.123663+04
14	5	7500.000	35000.000	9.8995	225.0000	2800.0000	.119746+04
15	5	8000.000	35000.000	9.8995	225.0000	2800.0000	.121049+04
16	5	8500.000	35000.000	9.8995	225.0000	2800.0000	.122351+04
17	5	9000.000	35000.000	9.8995	225.0000	2800.0000	.123140+04
18	5	9500.000	35000.000	9.8995	225.0000	2800.0000	.123397+04
19	5	9950.000	35000.000	9.8995	225.0000	2800.0000	.124443+04
20	5	10000.000	35000.000	9.8995	225.0000	2800.0000	.129671+04
21	5	10500.000	35000.000	9.8995	225.0000	2800.0000	.131240+04
22	5	11000.000	35000.000	9.8995	225.0000	2800.0000	.136203+04
23	5	11500.000	35000.000	9.8995	225.0000	2800.0000	.137506+04
24	5	12000.000	35000.000	9.8995	225.0000	2800.0000	.158411+04
25	5	12500.000	35000.000	9.8995	225.0000	2800.0000	.152660+04
26	5	13000.000	35000.000	9.8995	225.0000	2800.0000	.147174+04
27	5	13500.000	35000.000	9.8995	225.0000	2800.0000	.144560+04
28	5	14000.000	35000.000	9.8995	225.0000	2800.0000	.141946+04
29	5	14500.000	35000.000	9.8995	225.0000	2800.0000	.140386+04
30	5	15000.000	35000.000	9.8995	225.0000	2800.0000	.137771+04
31	5	15500.000	35000.000	9.8995	225.0000	2800.0000	.139340+04
32	5	16000.000	35000.000	9.8995	225.0000	2800.0000	.135157+04
33	5	16500.000	35000.000	9.8995	225.0000	2800.0000	.128360+04
34	5	17000.000	35000.000	9.8995	225.0000	2800.0000	.141166+04
35	5	17500.000	35000.000	9.8995	225.0000	2800.0000	.139340+04
36	5	18000.000	35000.000	9.8995	225.0000	2800.0000	.126011+04
37	5	18500.000	35000.000	9.8995	225.0000	2800.0000	.124556+04
38	5	19000.000	35000.000	9.8995	225.0000	2800.0000	.121644+04
39	5	19500.000	35000.000	9.8995	225.0000	2800.0000	.115820+04
40	5	20000.000	35000.000	9.8995	225.0000	2800.0000	.115820+04
41	5	20500.000	35000.000	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD LAYER HEIGHTS AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
4	6	1600.000	3570000.000	9.8995	225.0000	2800.0000	.115820+04
4	5	1600.000	3570000.000	9.8995	225.0000	2800.0000	.115820+04
5	5	2000.000	3570000.000	9.8995	225.0000	2800.0000	.115820+04
6	6	2400.000	3570000.000	9.8995	225.0000	2800.0000	.117911+04
7	5	2800.000	3570000.000	9.8995	225.0000	2800.0000	.118957+04
8	6	3200.000	3570000.000	9.8995	225.0000	2800.0000	.119480+04
9	5	3600.000	3570000.000	9.8995	225.0000	2800.0000	.119790+04
10	5	4000.000	3570000.000	9.8995	225.0000	2800.0000	.125580+04
11	5	4400.000	3570000.000	9.8995	225.0000	2800.0000	.134110+04
12	5	4800.000	3570000.000	9.8995	225.0000	2800.0000	.164590+04
13	5	5200.000	3570000.000	9.8995	225.0000	2800.0000	.213360+04
14	5	5600.000	3570000.000	9.8995	225.0000	2800.0000	.134720+04
15	5	6000.000	3570000.000	9.8995	225.0000	2800.0000	.124970+04
16	5	6400.000	3570000.000	9.8995	225.0000	2800.0000	.120400+04
17	5	6800.000	3570000.000	9.8995	225.0000	2800.0000	.121920+04
18	5	7200.000	3570000.000	9.8995	225.0000	2800.0000	.123440+04
19	5	7600.000	3570000.000	9.8995	225.0000	2800.0000	.124360+04
20	5	8000.000	3570000.000	9.8995	225.0000	2800.0000	.124660+04
21	5	8400.000	3570000.000	9.8995	225.0000	2800.0000	.125880+04
22	5	8800.000	3570000.000	9.8995	225.0000	2800.0000	.131980+04
23	5	9200.000	3570000.000	9.8995	225.0000	2800.0000	.133810+04
24	5	9600.000	3570000.000	9.8995	225.0000	2800.0000	.139600+04
25	5	10000.00	3570000.000	9.8995	225.0000	2800.0000	.141120+04
26	5	10400.00	3570000.000	9.8995	225.0000	2800.0000	.165510+04
27	5	10800.00	3570000.000	9.8995	225.0000	2800.0000	.158800+04
28	5	11200.00	3570000.000	9.8995	225.0000	2800.0000	.152400+04
29	5	11600.00	3570000.000	9.8995	225.0000	2800.0000	.149350+04
30	5	12000.00	3570000.000	9.8995	225.0000	2800.0000	.146300+04
31	5	12400.00	3570000.000	9.8995	225.0000	2800.0000	.144480+04
32	5	12800.00	3570000.000	9.8995	225.0000	2800.0000	.141430+04
33	5	13200.00	3570000.000	9.8995	225.0000	2800.0000	.143260+04
34	5	13600.00	3570000.000	9.8995	225.0000	2800.0000	.136380+04
35	5	14000.00	3570000.000	9.8995	225.0000	2800.0000	.130450+04
36	5	14400.00	3570000.000	9.8995	225.0000	2800.0000	.145390+04
37	5	14800.00	3570000.000	9.8995	225.0000	2800.0000	.143260+04
38	5	15200.00	3570000.000	9.8995	225.0000	2800.0000	.127710+04
39	5	15600.00	3570000.000	9.8995	225.0000	2800.0000	.126011+04
40	5	16000.00	3570000.000	9.8995	225.0000	2800.0000	.122614+04
41	5	16400.00	3570000.000	9.8995	225.0000	2800.0000	.115820+04
42	5	16800.00	3570000.000	9.8995	225.0000	2800.0000	.115820+04
43	5	17200.00	3570000.000	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD, LAYER HEIGHTS AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
4	7	1.000E+05	3.575E+06	9.8995	225.0000	2800.0000	.115820+04
5	7	1.500E+05	3.575E+06	9.8995	225.0000	2800.0000	.115820+04
3	7	2.000E+05	3.575E+06	9.8995	225.0000	2800.0000	.115820+04
4	7	2.500E+05	3.575E+06	9.8995	225.0000	2800.0000	.117563+04
5	7	3.000E+05	3.575E+06	9.8995	225.0000	2800.0000	.118434+04
6	7	3.500E+05	3.575E+06	9.8995	225.0000	2800.0000	.118870+04
7	7	4.000E+05	3.575E+06	9.8995	225.0000	2800.0000	.121620+04
8	7	4.500E+05	3.575E+06	9.8995	225.0000	2800.0000	.149350+04
9	7	5.000E+05	3.575E+06	9.8995	225.0000	2800.0000	.140210+04
10	7	5.500E+05	3.575E+06	9.8995	225.0000	2800.0000	.170690+04
11	7	6.000E+05	3.575E+06	9.8995	225.0000	2800.0000	.225550+04
12	7	6.500E+05	3.575E+06	9.8995	225.0000	2800.0000	.140210+04
13	7	7.000E+05	3.575E+06	9.8995	225.0000	2800.0000	.123750+04
14	7	7.500E+05	3.575E+06	9.8995	225.0000	2800.0000	.121920+04
15	7	8.000E+05	3.575E+06	9.8995	225.0000	2800.0000	.122230+04
16	7	8.500E+05	3.575E+06	9.8995	225.0000	2800.0000	.123750+04
17	7	9.000E+05	3.575E+06	9.8995	225.0000	2800.0000	.124360+04
18	7	9.500E+05	3.575E+06	9.8995	225.0000	2800.0000	.124660+04
19	7	1.000E+06	3.575E+06	9.8995	225.0000	2800.0000	.124970+04
20	7	1.050E+06	3.575E+06	9.8995	225.0000	2800.0000	.128020+04
21	7	1.100E+06	3.575E+06	9.8995	225.0000	2800.0000	.128630+04
22	7	1.150E+06	3.575E+06	9.8995	225.0000	2800.0000	.133500+04
23	7	1.200E+06	3.575E+06	9.8995	225.0000	2800.0000	.143870+04
24	7	1.250E+06	3.575E+06	9.8995	225.0000	2800.0000	.160330+04
25	7	1.300E+06	3.575E+06	9.8995	225.0000	2800.0000	.159410+04
26	7	1.350E+06	3.575E+06	9.8995	225.0000	2800.0000	.153310+04
27	7	1.400E+06	3.575E+06	9.8995	225.0000	2800.0000	.152400+04
28	7	1.450E+06	3.575E+06	9.8995	225.0000	2800.0000	.146740+04
29	7	1.500E+06	3.575E+06	9.8995	225.0000	2800.0000	.142040+04
30	7	1.550E+06	3.575E+06	9.8995	225.0000	2800.0000	.136550+04
31	7	1.600E+06	3.575E+06	9.8995	225.0000	2800.0000	.132590+04
32	7	1.650E+06	3.575E+06	9.8995	225.0000	2800.0000	.131060+04
33	7	1.700E+06	3.575E+06	9.8995	225.0000	2800.0000	.140210+04
34	7	1.750E+06	3.575E+06	9.8995	225.0000	2800.0000	.146300+04
35	7	1.800E+06	3.575E+06	9.8995	225.0000	2800.0000	.134110+04
36	7	1.850E+06	3.575E+06	9.8995	225.0000	2800.0000	.127410+04
37	7	1.900E+06	3.575E+06	9.8995	225.0000	2800.0000	.125754+04
38	7	1.950E+06	3.575E+06	9.8995	225.0000	2800.0000	.122443+04
39	7	2.000E+06	3.575E+06	9.8995	225.0000	2800.0000	.115820+04
40	7	2.050E+06	3.575E+06	9.8995	225.0000	2800.0000	.115820+04
41	7	2.100E+06	3.575E+06	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELDS, LAYER HEIGHTS, AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	1	1[illegible]	35[illegible]	9.9995	225.0000	2800.0000	.115820+04
2	2	1[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.115820+04
3	3	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.115820+04
4	4	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.117563+04
5	5	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.118434+04
6	6	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.118870+04
7	7	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.126020+04
8	8	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.134110+04
9	9	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.144480+04
10	10	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.170690+04
11	11	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.243840+04
12	12	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.146300+04
13	13	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.121920+04
14	14	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.134110+04
15	15	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.120098+04
16	16	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.123440+04
17	17	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.124050+04
18	18	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.124660+04
19	19	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.124970+04
20	20	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.124970+04
21	21	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.126800+04
22	22	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.133500+04
23	23	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.143260+04
24	24	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.158500+04
25	25	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.160630+04
26	26	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.152400+04
27	27	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.150570+04
28	28	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.148740+04
29	29	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.146300+04
30	30	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.135940+04
31	31	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.131670+04
32	32	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.137160+04
33	33	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.159720+04
34	34	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.143870+04
35	35	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.143260+04
36	36	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.140210+04
37	37	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.136726+04
38	38	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.129757+04
39	39	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.115820+04
40	40	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.115820+04
41	41	[illegible]	35[illegible]	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	9	100000.000	3585000.000	9.8995	225.0000	2800.0000	.115820+04
2	9	100000.000	3585000.000	9.8995	225.0000	2800.0000	.115820+04
3	9	200000.000	3585000.000	9.8995	225.0000	2800.0000	.115820+04
4	9	310000.000	3585000.000	9.8995	225.0000	2800.0000	.119306+04
5	9	320000.000	3585000.000	9.8995	225.0000	2800.0000	.121049+04
6	9	330000.000	3585000.000	9.8995	225.0000	2800.0000	.121920+04
7	9	335000.000	3585000.000	9.8995	225.0000	2800.0000	.129850+04
8	9	340000.000	3585000.000	9.8995	225.0000	2800.0000	.134720+04
9	9	345000.000	3585000.000	9.8995	225.0000	2800.0000	.140820+04
10	9	350000.000	3585000.000	9.8995	225.0000	2800.0000	.170690+04
11	9	355000.000	3585000.000	9.8995	225.0000	2800.0000	.146300+04
12	9	360000.000	3585000.000	9.8995	225.0000	2800.0000	.131670+04
13	9	365000.000	3585000.000	9.8995	225.0000	2800.0000	.122830+04
14	9	370000.000	3585000.000	9.8995	225.0000	2800.0000	.120700+04
15	9	375000.000	3585000.000	9.8995	225.0000	2800.0000	.122230+04
16	9	380000.000	3585000.000	9.8995	225.0000	2800.0000	.123140+04
17	9	385000.000	3585000.000	9.8995	225.0000	2800.0000	.123750+04
18	9	390000.000	3585000.000	9.8995	225.0000	2800.0000	.124970+04
19	9	395000.000	3585000.000	9.8995	225.0000	2800.0000	.134110+04
20	9	400000.000	3585000.000	9.8995	225.0000	2800.0000	.128320+04
21	9	405000.000	3585000.000	9.8995	225.0000	2800.0000	.125880+04
22	9	410000.000	3585000.000	9.8995	225.0000	2800.0000	.129240+04
23	9	415000.000	3585000.000	9.8995	225.0000	2800.0000	.140210+04
24	9	420000.000	3585000.000	9.8995	225.0000	2800.0000	.162460+04
25	9	425000.000	3585000.000	9.8995	225.0000	2800.0000	.152400+04
26	9	430000.000	3585000.000	9.8995	225.0000	2800.0000	.146300+04
27	9	435000.000	3585000.000	9.8995	225.0000	2800.0000	.145090+04
28	9	440000.000	3585000.000	9.8995	225.0000	2800.0000	.146910+04
29	9	445000.000	3585000.000	9.8995	225.0000	2800.0000	.145390+04
30	9	450000.000	3585000.000	9.8995	225.0000	2800.0000	.142040+04
31	9	455000.000	3585000.000	9.8995	225.0000	2800.0000	.138680+04
32	9	460000.000	3585000.000	9.8995	225.0000	2800.0000	.164590+04
33	9	465000.000	3585000.000	9.8995	225.0000	2800.0000	.156360+04
34	9	470000.000	3585000.000	9.8995	225.0000	2800.0000	.152400+04
35	9	475000.000	3585000.000	9.8995	225.0000	2800.0000	.153920+04
36	9	480000.000	3585000.000	9.8995	225.0000	2800.0000	.146300+04
37	9	485000.000	3585000.000	9.8995	225.0000	2800.0000	.141946+04
38	9	490000.000	3585000.000	9.8995	225.0000	2800.0000	.133237+04
39	9	495000.000	3585000.000	9.8995	225.0000	2800.0000	.115820+04
40	9	509000.000	3585000.000	9.8995	225.0000	2800.0000	.115820+04
41	9	[illegible]	3585000.000	9.8995	225.0000	2800.0000	.115620+04

** INITIAL WIND FIELDS LAYER HEIGHTS AND TERRAIN HEIGHTS **

I	J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	11	1000.000	3590000.000	9.8995	225.0000	2800.0000	.115820+04
2	11	1500.000	3590000.000	9.8995	225.0000	2800.0000	.115820+04
3	11	2000.000	3590000.000	9.8995	225.0000	2800.0000	.115820+04
4	11	2500.000	3590000.000	9.8995	225.0000	2800.0000	.120270+04
5	11	3000.000	3590000.000	9.8995	225.0000	2800.0000	.131490+04
6	11	3500.000	3590000.000	9.8995	225.0000	2800.0000	.134110+04
7	11	4000.000	3590000.000	9.8995	225.0000	2800.0000	.135940+04
8	11	4500.000	3590000.000	9.8995	225.0000	2800.0000	.132890+04
9	11	5000.000	3590000.000	9.8995	225.0000	2800.0000	.139980+04
10	11	5500.000	3590000.000	9.8995	225.0000	2800.0000	.154240+04
11	11	6000.000	3590000.000	9.8995	225.0000	2800.0000	.160020+04
12	11	6500.000	3590000.000	9.8995	225.0000	2800.0000	.136990+04
13	11	7000.000	3590000.000	9.8995	225.0000	2800.0000	.121920+04
14	11	7500.000	3590000.000	9.8995	225.0000	2800.0000	.120400+04
15	11	8000.000	3590000.000	9.8995	225.0000	2800.0000	.122530+04
16	11	8500.000	3590000.000	9.8995	225.0000	2800.0000	.121620+04
17	11	9000.000	3590000.000	9.8995	225.0000	2800.0000	.122530+04
18	11	9500.000	3590000.000	9.8995	225.0000	2800.0000	.124970+04
19	11	10000.000	3590000.000	9.8995	225.0000	2800.0000	.152400+04
20	11	10500.000	3590000.000	9.8995	225.0000	2800.0000	.128020+04
21	11	11000.000	3590000.000	9.8995	225.0000	2800.0000	.125580+04
22	11	11500.000	3590000.000	9.8995	225.0000	2800.0000	.125580+04
23	11	12000.000	3590000.000	9.8995	225.0000	2800.0000	.134110+04
24	11	12500.000	3590000.000	9.8995	225.0000	2800.0000	.164590+04
25	11	13000.000	3590000.000	9.8995	225.0000	2800.0000	.147630+04
26	11	13500.000	3590000.000	9.8995	225.0000	2800.0000	.149350+04
27	11	14000.000	3590000.000	9.8995	225.0000	2800.0000	.152400+04
28	11	14500.000	3590000.000	9.8995	225.0000	2800.0000	.151790+04
29	11	15000.000	3590000.000	9.8995	225.0000	2800.0000	.152710+04
30	11	15500.000	3590000.000	9.8995	225.0000	2800.0000	.149350+04
31	11	16000.000	3590000.000	9.8995	225.0000	2800.0000	.176780+04
32	11	16500.000	3590000.000	9.8995	225.0000	2800.0000	.170690+04
33	11	17000.000	3590000.000	9.8995	225.0000	2800.0000	.153620+04
34	11	17500.000	3590000.000	9.8995	225.0000	2800.0000	.164590+04
35	11	18000.000	3590000.000	9.8995	225.0000	2800.0000	.170690+04
36	11	18500.000	3590000.000	9.8995	225.0000	2800.0000	.149350+04
37	11	19000.000	3590000.000	9.8995	225.0000	2800.0000	.144560+04
38	11	19500.000	3590000.000	9.8995	225.0000	2800.0000	.134980+04
39	11	20000.000	3590000.000	9.8995	225.0000	2800.0000	.115820+04
40	11	20500.000	3590000.000	9.8995	225.0000	2800.0000	.115820+04
41	11	21000.000	3590000.000	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
4	11	1x0000.000	3595000.000	9.8995	225.0000	2800.0000	.115820+04
6	11	1x0000.000	3595000.000	9.8995	225.0000	2800.0000	.115820+04
3	11	2x0000.000	3595000.000	9.8995	225.0000	2800.0000	.115820+04
4	11	3x0000.000	3595000.000	9.8995	225.0000	2800.0000	.133237+04
5	11	3x0000.000	3595000.000	9.8995	225.0000	2800.0000	.141946+04
6	11	3x0000.000	3595000.000	9.8995	225.0000	2800.0000	.146300+04
7	11	3x5000.000	3595000.000	9.8995	225.0000	2800.0000	.134110+04
8	11	3x0000.000	3595000.000	9.8995	225.0000	2800.0000	.132890+04
9	11	3x5000.000	3595000.000	9.8995	225.0000	2800.0000	.138380+04
10	11	3x0000.000	3595000.000	9.8995	225.0000	2800.0000	.152710+04
11	11	3x5000.000	3595000.000	9.8995	225.0000	2800.0000	.213360+04
12	11	3x0000.000	3595000.000	9.8995	225.0000	2800.0000	.152400+04
13	11	3x5000.000	3595000.000	9.8995	225.0000	2800.0000	.125880+04
14	11	3x7000.000	3595000.000	9.8995	225.0000	2800.0000	.120700+04
15	11	3x7500.000	3595000.000	9.8995	225.0000	2800.0000	.121310+04
16	11	3x8000.000	3595000.000	9.8995	225.0000	2800.0000	.121620+04
17	11	3x5000.000	3595000.000	9.8995	225.0000	2800.0000	.122230+04
18	11	3x9000.000	3595000.000	9.8995	225.0000	2800.0000	.123440+04
19	11	3x9500.000	3595000.000	9.8995	225.0000	2800.0000	.140210+04
20	11	4x0000.000	3595000.000	9.8995	225.0000	2800.0000	.[illegible]6490+04
21	11	4x0500.000	3595000.000	9.8995	225.0000	2800.0000	.12[illegible]530+04
22	11	4x1000.000	3595000.000	9.8995	225.0000	2800.0000	.124[illegible]50+04
23	11	4x1500.000	3595000.000	9.8995	225.0000	2800.0000	.131060+04
24	11	4x2000.000	3595000.000	9.8995	225.0000	2800.0000	.140210+04
25	11	4x2500.000	3595000.000	9.8995	225.0000	2800.0000	.15[illegible]30+04
26	11	4x3000.000	3595000.000	9.8995	225.0000	2800.0000	.154840+04
27	11	4x3500.000	3595000.000	9.8995	225.0000	2800.0000	.164590+04
28	11	4x4000.000	3595000.000	9.8995	225.0000	2800.0000	.132890+04
29	11	4x4500.000	3595000.000	9.8995	225.0000	2800.0000	.163370+04
30	11	4x5000.000	3595000.000	9.8995	225.0000	2800.0000	.190500+04
31	11	4x5500.000	3595000.000	9.8995	225.0000	2800.0000	.182880+04
32	11	4x6000.000	3595000.000	9.8995	225.0000	2800.0000	.170690+04
33	11	4x6500.000	3595000.000	9.8995	225.0000	2800.0000	.165200+04
34	11	4x7000.000	3595000.000	9.8995	225.0000	2800.0000	.173740+04
35	11	4x7500.000	3595000.000	9.8995	225.0000	2800.0000	.182880+04
36	11	4x8000.000	3595000.000	9.8995	225.0000	2800.0000	.152400+04
37	11	4x8500.000	3595000.000	9.8995	225.0000	2800.0000	.147174+04
38	11	4x9000.000	3595000.000	9.8995	225.0000	2800.0000	.136723+04
39	11	4x9500.000	3595000.000	9.8995	225.0000	2800.0000	.115820+04
40	11	5x0000.000	3595000.000	9.8995	225.0000	2800.0000	.115820+04
41	11	5x0500.000	3595000.000	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD LAYER HEIGHTS AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
4	12	1.300E+06	3.600E+06	9.8995	225.0000	2800.0000	.115820+04
4	12	1.300E+06	3.600E+06	9.8995	225.0000	2800.0000	.115820+04
3	12	1.250E+06	3.600E+06	9.8995	225.0000	2800.0000	.115820+04
4	12	1.200E+06	3.600E+06	9.8995	225.0000	2800.0000	.126969+04
5	12	1.150E+06	3.600E+06	9.8995	225.0000	2800.0000	.132543+04
6	12	1.100E+06	3.600E+06	9.8995	225.0000	2800.0000	.135330+04
7	12	1.050E+06	3.600E+06	9.8995	225.0000	2800.0000	.132590+04
8	12	1.000E+06	3.600E+06	9.8995	225.0000	2800.0000	.132890+04
9	12	9.500E+05	3.600E+06	9.8995	225.0000	2800.0000	.138990+04
10	12	9.000E+05	3.600E+06	9.8995	225.0000	2800.0000	.150570+04
11	12	8.500E+05	3.600E+06	9.8995	225.0000	2800.0000	.182880+04
12	12	8.000E+05	3.600E+06	9.8995	225.0000	2800.0000	.170690+04
13	12	7.500E+05	3.600E+06	9.8995	225.0000	2800.0000	.134110+04
14	12	7.000E+05	3.600E+06	9.8995	225.0000	2800.0000	.121310+04
15	12	6.750E+05	3.600E+06	9.8995	225.0000	2800.0000	.121310+04
16	12	6.500E+05	3.600E+06	9.8995	225.0000	2800.0000	.121310+04
17	12	6.250E+05	3.600E+06	9.8995	225.0000	2800.0000	.121920+04
18	12	6.000E+05	3.600E+06	9.8995	225.0000	2800.0000	.122230+04
19	12	5.750E+05	3.600E+06	9.8995	225.0000	2800.0000	.123750+04
20	12	5.500E+05	3.600E+06	9.8995	225.0000	2800.0000	.122830+04
21	12	5.250E+05	3.600E+06	9.8995	225.0000	2800.0000	.122830+04
22	12	5.000E+05	3.600E+06	9.8995	225.0000	2800.0000	.124360+04
23	12	4.750E+05	3.600E+06	9.8995	225.0000	2800.0000	.130450+04
24	12	4.500E+05	3.600E+06	9.8995	225.0000	2800.0000	.143260+04
25	12	4.250E+05	3.600E+06	9.8995	225.0000	2800.0000	.170690+04
26	12	4.000E+05	3.600E+06	9.8995	225.0000	2800.0000	.182880+04
27	12	3.750E+05	3.600E+06	9.8995	225.0000	2800.0000	.182880+04
28	12	3.500E+05	3.600E+06	9.8995	225.0000	2800.0000	.184100+04
29	12	3.250E+05	3.600E+06	9.8995	225.0000	2800.0000	.175870+04
30	12	3.000E+05	3.600E+06	9.8995	225.0000	2800.0000	.189890+04
31	12	2.750E+05	3.600E+06	9.8995	225.0000	2800.0000	.207260+04
32	12	2.500E+05	3.600E+06	9.8995	225.0000	2800.0000	.188990+04
33	12	2.250E+05	3.600E+06	9.8995	225.0000	2800.0000	.173740+04
34	12	2.000E+05	3.600E+06	9.8995	225.0000	2800.0000	.176780+04
35	12	1.750E+05	3.600E+06	9.8995	225.0000	2800.0000	.176780+04
36	12	1.500E+05	3.600E+06	9.8995	225.0000	2800.0000	.158500+04
37	12	1.250E+05	3.600E+06	9.8995	225.0000	2800.0000	.152403+04
38	12	1.000E+05	3.600E+06	9.8995	225.0000	2800.0000	.140209+04
39	12	7.500E+04	3.600E+06	9.8995	225.0000	2800.0000	.115820+04
40	12	5.000E+04	3.600E+06	9.8995	225.0000	2800.0000	.115820+04
41	12	2.500E+04	3.600E+06	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	13	160000.000	3605000.000	9.8995	225.0000	2800.0000	.115620+04
2	13	180000.000	3605000.000	9.8995	225.0000	2800.0000	.115820+04
3	13	250000.000	3605000.000	9.8995	225.0000	2800.0000	.115820+04
4	13	310000.000	3605000.000	9.8995	225.0000	2800.0000	.125574+04
5	13	320000.000	3605000.000	9.8995	225.0000	2800.0000	.130451+04
6	13	330000.000	3605000.000	9.8995	225.0000	2800.0000	.132890+04
7	13	335000.000	3605000.000	9.8995	225.0000	2800.0000	.132590+04
8	13	340000.000	3605000.000	9.8995	225.0000	2800.0000	.132590+04
9	13	345000.000	3605000.000	9.8995	225.0000	2800.0000	.138070+04
10	13	350000.000	3605000.000	9.8995	225.0000	2800.0000	.148740+04
11	13	355000.000	3605000.000	9.8995	225.0000	2800.0000	.207260+04
12	13	360000.000	3605000.000	9.8995	225.0000	2800.0000	.188980+04
13	13	365000.000	3605000.000	9.8995	225.0000	2800.0000	.161540+04
14	13	370000.000	3605000.000	9.8995	225.0000	2800.0000	.121310+04
15	13	375000.000	3605000.000	9.8995	225.0000	2800.0000	.121310+04
16	13	380000.000	3605000.000	9.8995	225.0000	2800.0000	.121620+04
17	13	385000.000	3605000.000	9.8995	225.0000	2800.0000	.121620+04
18	13	390000.000	3605000.000	9.8995	225.0000	2800.0000	.121920+04
19	13	395000.000	3605000.000	9.8995	225.0000	2800.0000	.122230+04
20	13	400000.000	3605000.000	9.8995	225.0000	2800.0000	.123440+04
21	13	405000.000	3605000.000	9.8995	225.0000	2800.0000	.123440+04
22	13	410000.000	3605000.000	9.8995	225.0000	2800.0000	.124970+04
23	13	415000.000	3605000.000	9.8995	225.0000	2800.0000	.129850+04
24	13	420000.000	3605000.000	9.8995	225.0000	2800.0000	.140210+04
25	13	425000.000	3605000.000	9.8995	225.0000	2800.0000	.158500+04
26	13	430000.000	3605000.000	9.8995	225.0000	2800.0000	.207260+04
27	13	435000.000	3605000.000	9.8995	225.0000	2800.0000	.195070+04
28	13	440000.000	3605000.000	9.8995	225.0000	2800.0000	.201170+04
29	13	445000.000	3605000.000	9.8995	225.0000	2800.0000	.195070+04
30	13	450000.000	3605000.000	9.8995	225.0000	2800.0000	.193550+04
31	13	455000.000	3605000.000	9.8995	225.0000	2800.0000	.204220+04
32	13	460000.000	3605000.000	9.8995	225.0000	2800.0000	.185930+04
33	13	465000.000	3605000.000	9.8995	225.0000	2800.0000	.182880+04
34	13	470000.000	3605000.000	9.8995	225.0000	2800.0000	.181660+04
35	13	475000.000	3605000.000	9.8995	225.0000	2800.0000	.195070+04
36	13	480000.000	3605000.000	9.8995	225.0000	2800.0000	.198120+04
37	13	490000.000	3605000.000	9.8995	225.0000	2800.0000	.186363+04
38	13	510000.000	3605000.000	9.8995	225.0000	2800.0000	.162849+04
39	13	530000.000	3605000.000	9.8995	225.0000	2800.0000	.115820+04
40	13	550000.000	3605000.000	9.8995	225.0000	2800.0000	.115820+04
41	13	610000.000	3605000.000	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	14	100000.000	3610000.000	9.8995	225.0000	2800.0000	.115820+04
2	14	150000.000	3610000.000	9.8995	225.0000	2800.0000	.115820+04
3	14	200000.000	3610000.000	9.8995	225.0000	2800.0000	.115820+04
4	14	300000.000	3610000.000	9.8995	225.0000	2800.0000	.124877+04
5	14	320000.000	3610000.000	9.8995	225.0000	2800.0000	.129406+04
6	14	330000.000	3610000.000	9.8995	225.0000	2800.0000	.131670+04
7	14	335000.000	3610000.000	9.8995	225.0000	2800.0000	.132280+04
8	14	340000.000	3610000.000	9.8995	225.0000	2800.0000	.133810+04
9	14	345000.000	3610000.000	9.8995	225.0000	2800.0000	.138990+04
10	14	350000.000	3610000.000	9.8995	225.0000	2800.0000	.147220+04
11	14	355000.000	3610000.000	9.8995	225.0000	2800.0000	.182880+04
12	14	360000.000	3610000.000	9.8995	225.0000	2800.0000	.173740+04
13	14	365000.000	3610000.000	9.8995	225.0000	2800.0000	.128630+04
14	14	370000.000	3610000.000	9.8995	225.0000	2800.0000	.120700+04
15	14	375000.000	3610000.000	9.8995	225.0000	2800.0000	.121010+04
16	14	380000.000	3610000.000	9.8995	225.0000	2800.0000	.121010+04
17	14	385000.000	3610000.000	9.8995	225.0000	2800.0000	.121620+04
18	14	390000.000	3610000.000	9.8995	225.0000	2800.0000	.122230+04
19	14	395000.000	3610000.000	9.8995	225.0000	2800.0000	.122530+04
20	14	400000.000	3610000.000	9.8995	225.0000	2800.0000	.122530+04
21	14	405000.000	3610000.000	9.8995	225.0000	2800.0000	.122230+04
22	14	410000.000	3610000.000	9.8995	225.0000	2800.0000	.125580+04
23	14	415000.000	3610000.000	9.8995	225.0000	2800.0000	.130150+04
24	14	420000.000	3610000.000	9.8995	225.0000	2800.0000	.142040+04
25	14	425000.000	3610000.000	9.8995	225.0000	2800.0000	.182840+04
26	14	430000.000	3610000.000	9.8995	225.0000	2800.0000	.217630+04
27	14	435000.000	3610000.000	9.8995	225.0000	2800.0000	.213970+04
28	14	440000.000	3610000.000	9.8995	225.0000	2800.0000	.213350+04
29	14	445000.000	3610000.000	9.8995	225.0000	2800.0000	.216410+04
30	14	450000.000	3610000.000	9.8995	225.0000	2800.0000	.219460+04
31	14	455000.000	3610000.000	9.8995	225.0000	2800.0000	.209090+04
32	14	460000.000	3610000.000	9.8995	225.0000	2800.0000	.190810+04
33	14	465000.000	3610000.000	9.8995	225.0000	2800.0000	.210920+04
34	14	470000.000	3610000.000	9.8995	225.0000	2800.0000	.195070+04
35	14	475000.000	3610000.000	9.8995	225.0000	2800.0000	.189890+04
36	14	480000.000	3610000.000	9.8995	225.0000	2800.0000	.182880+04
37	14	490000.000	3610000.000	9.8995	225.0000	2800.0000	.173300+04
38	14	510000.000	3610000.000	9.8995	225.0000	2800.0000	.154140+04
39	14	550000.000	3610000.000	9.8995	225.0000	2800.0000	.115820+04
40	14	600000.000	3610000.000	9.8995	225.0000	2800.0000	.115820+04
41	14	720000.000	3610000.000	9.8995	225.0000	2800.0000	.115820+04

** Initial Wind Field, Layer Height, and Terrain Heights **

X Index I	Y Index J	X Coordinate (FEET/M)	Y Coordinate (METERS)	Wind Speed (METERS/SEC)	Direction (DEGREES)	Layer Height (METERS)	Terrain Height (METERS)
1	15	1x0000.000	3615000.000	9.8995	225.0000	2800.0000	.115820+04
2	15	1x0000.000	3615000.000	9.8995	225.0000	2800.0000	.115820+04
3	15	2x0000.000	3615000.000	9.8995	225.0000	2800.0000	.115820+04
4	15	3x0000.000	3615000.000	9.8995	225.0000	2800.0000	.125923+04
5	15	3x0000.000	3615000.000	9.8995	225.0000	2800.0000	.130974+04
6	15	3x0000.000	3615000.000	9.8995	225.0000	2800.0000	.133500+04
7	15	3x5000.000	3615000.000	9.8995	225.0000	2800.0000	.133500+04
8	15	3x0000.000	3615000.000	9.8995	225.0000	2800.0000	.135030+04
9	15	3x5000.000	3615000.000	9.8995	225.0000	2800.0000	.141430+04
10	15	3x0000.000	3615000.000	9.8995	225.0000	2800.0000	.153010+04
11	15	3x5000.000	3615000.000	9.8995	225.0000	2800.0000	.225550+04
12	15	3x0000.000	3615000.000	9.8995	225.0000	2800.0000	.137160+04
13	15	3x5000.000	3615000.000	9.8995	225.0000	2800.0000	.121920+04
14	15	3x7000.000	3615000.000	9.8995	225.0000	2800.0000	.120700+04
15	15	3x5000.000	3615000.000	9.8995	225.0000	2800.0000	.121920+04
16	15	3x0000.000	3615000.000	9.8995	225.0000	2800.0000	.121010+04
17	15	3x5000.000	3615000.000	9.8995	225.0000	2800.0000	.121310+04
18	15	3x0000.000	3615000.000	9.8995	225.0000	2800.0000	.121920+04
19	15	3x5000.000	3615000.000	9.8995	225.0000	2800.0000	.122230+04
20	15	4x0000.000	3615000.000	9.8995	225.0000	2800.0000	.121920+04
21	15	4x5000.000	3615000.000	9.8995	225.0000	2800.0000	.121920+04
22	15	4x0000.000	3615000.000	9.8995	225.0000	2800.0000	.124360+04
23	15	4x5000.000	3615000.000	9.8995	225.0000	2800.0000	.127410+04
24	15	4x0000.000	3615000.000	9.8995	225.0000	2800.0000	.150880+04
25	15	4x5000.000	3615000.000	9.8995	225.0000	2800.0000	.195680+04
26	15	5x0000.000	3615000.000	9.8995	225.0000	2800.0000	.213360+04
27	15	5x5000.000	3615000.000	9.8995	225.0000	2800.0000	.237740+04
28	15	5x0000.000	3615000.000	9.8995	225.0000	2800.0000	.259690+04
29	15	5x5000.000	3615000.000	9.8995	225.0000	2800.0000	.237740+04
30	15	6x0000.000	3615000.000	9.8995	225.0000	2800.0000	.219460+04
31	15	6x5000.000	3615000.000	9.8995	225.0000	2800.0000	.210310+04
32	15	6x0000.000	3615000.000	9.8995	225.0000	2800.0000	.201170+04
33	15	6x5000.000	3615000.000	9.8995	225.0000	2800.0000	.192020+04
34	15	7x0000.000	3615000.000	9.8995	225.0000	2800.0000	.192020+04
35	15	7x5000.000	3615000.000	9.8995	225.0000	2800.0000	.180750+04
36	15	8x0000.000	3615000.000	9.8995	225.0000	2800.0000	.182880+04
37	15	8x5000.000	3615000.000	9.8995	225.0000	2800.0000	.173300+04
38	15	9x0000.000	3615000.000	9.8995	225.0000	2800.0000	.154140+04
39	15	9x5000.000	3615000.000	9.8995	225.0000	2800.0000	.115820+04
40	15	10x0000.000	3615000.000	9.8995	225.0000	2800.0000	.115820+04
41	15	10x5000.000	3615000.000	9.8995	225.0000	2800.0000	.115820+04

** INITIAL WIND FIELD, LAYER HEIGHT, AND TERRAIN HEIGHTS **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	TERRAIN HEIGHT (METERS)
1	10	1000.000	36200.000	9.8995	225.0000	2800.0000	.115820+04
2	10	1500.000	36200.000	9.8995	225.0000	2800.0000	.115820+04
3	10	2000.000	36200.000	9.8995	225.0000	2800.0000	.115820+04
4	10	2500.000	36200.000	9.8995	225.0000	2800.0000	.124877+04
5	10	3000.000	36200.000	9.8995	225.0000	2800.0000	.129406+04
6	10	3500.000	36200.000	9.8995	225.0000	2800.0000	.131670+04
7	10	4000.000	36200.000	9.8995	225.0000	2800.0000	.134110+04
8	10	4500.000	36200.000	9.8995	225.0000	2800.0000	.138990+04
9	10	5000.000	36200.000	9.8995	225.0000	2800.0000	.144480+04
10	10	5500.000	36200.000	9.8995	225.0000	2800.0000	.155450+04
11	10	6000.000	36200.000	9.8995	225.0000	2800.0000	.231650+04
12	10	6500.000	36200.000	9.8995	225.0000	2800.0000	.134110+04
13	10	7000.000	36200.000	9.8995	225.0000	2800.0000	.121010+04
14	10	7500.000	36200.000	9.8995	225.0000	2800.0000	.120090+04
15	10	8000.000	36200.000	9.8995	225.0000	2800.0000	.119480+04
16	10	8500.000	36200.000	9.8995	225.0000	2800.0000	.121310+04
17	10	9000.000	36200.000	9.8995	225.0000	2800.0000	.121310+04
18	10	9500.000	36200.000	9.8995	225.0000	2800.0000	.121620+04
19	10	10000.000	36200.000	9.8995	225.0000	2800.0000	.128020+04
20	10	10500.000	36200.000	9.8995	225.0000	2800.0000	.121920+04
21	10	11000.000	36200.000	9.8995	225.0000	2800.0000	.122230+04
22	10	11500.000	36200.000	9.8995	225.0000	2800.0000	.123750+04
23	10	12000.000	36200.000	9.8995	225.0000	2800.0000	.128020+04
24	10	12500.000	36200.000	9.8995	225.0000	2800.0000	.201170+04
25	10	13000.000	36200.000	9.8995	225.0000	2800.0000	.223720+04
26	10	13500.000	36200.000	9.8995	225.0000	2800.0000	.243840+04
27	10	14000.000	36200.000	9.8995	225.0000	2800.0000	.265180+04
28	10	14500.000	36200.000	9.8995	225.0000	2800.0000	.262130+04
29	10	15000.000	36200.000	9.8995	225.0000	2800.0000	.234700+04
30	10	15500.000	36200.000	9.8995	225.0000	2800.0000	.225550+04
31	10	16000.000	36200.000	9.8995	225.0000	2800.0000	.215800+04
32	10	16500.000	36200.000	9.8995	225.0000	2800.0000	.207260+04
33	10	17000.000	36200.000	9.8995	225.0000	2800.0000	.195070+04
34	10	17500.000	36200.000	9.8995	225.0000	2800.0000	.204220+04
35	10	18000.000	36200.000	9.8995	225.0000	2800.0000	.188980+04
36	10	18500.000	36200.000	9.8995	225.0000	2800.0000	.173740+04
37	10	19000.000	36200.000	9.8995	225.0000	2800.0000	.165466+04
38	10	19500.000	36200.000	9.8995	225.0000	2800.0000	.148917+04
39	10	20000.000	36200.000	9.8995	225.0000	2800.0000	.115820+04
40	10	20500.000	36200.000	9.8995	225.0000	2800.0000	.115820+04
41	10	21000.000	36200.000	9.8995	225.0000	2800.0000	.115820+04

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX i	Y INDEX j	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
4	1	1x0000.000	334000.000	9.7036	224.8071	2825.0465	.000000
5	1	1x0000.000	334000.000	9.7036	224.8071	2825.0465	.000000
6	1	2x0000.000	334000.000	9.6386	224.7657	2832.5677	.000000
7	1	3x0000.000	334000.000	9.5649	224.9054	2838.6960	.000000
8	1	3x0000.000	334000.000	9.5636	225.5370	2830.4620	.000000
9	1	3x0000.000	334000.000	9.6603	226.6107	2806.0741	.000000
10	1	3x5000.000	334000.000	9.7693	227.4931	2784.7942	.000000
11	1	3x0000.000	334000.000	9.7857	226.0651	2774.9345	.000000
12	1	3x5000.000	334000.000	9.7700	226.4426	2772.0087	.000000
13	1	3x0000.000	334000.000	9.6969	226.4219	2781.4559	.000000
14	1	3x5000.000	334000.000	9.5960	227.9601	2803.3430	.000000
15	1	3x0000.000	334000.000	9.4453	227.4441	2823.2691	.000000
16	1	3x5000.000	334000.000	9.4044	227.2417	2829.1864	.000000
17	1	3x0000.000	334000.000	9.4188	227.2796	2823.5485	.000000
18	1	3x5000.000	334000.000	9.4540	227.3221	2815.4928	.000000
19	1	3x0000.000	334000.000	9.5003	227.3319	2808.5199	.000000
20	1	3x5000.000	334000.000	9.5411	227.3590	2801.3165	.000000
21	1	3x0000.000	334000.000	9.5721	227.4082	2793.1879	.000000
22	1	3x5000.000	334000.000	9.7043	227.4576	2784.6949	.000000
23	1	4x0000.000	334000.000	9.7694	227.4926	2777.4971	.000000
24	1	4x5000.000	334000.000	9.8216	227.5104	2771.7563	.000000
25	1	5x0000.000	334000.000	9.8524	227.4996	2768.4720	.000000
26	1	5x5000.000	334000.000	9.8516	227.4124	2769.0853	.000000
27	1	6x0000.000	334000.000	9.8136	227.2111	2774.7496	.000000
28	1	6x5000.000	334000.000	9.7584	226.9711	2783.0080	.000000
29	1	7x0000.000	334000.000	9.7001	226.8197	2789.7424	.000000
30	1	7x5000.000	334000.000	9.6513	226.8044	2792.8695	.000000
31	1	8x0000.000	334000.000	9.6103	226.8043	2792.9237	.000000
32	1	8x5000.000	334000.000	9.5733	227.0148	2792.1805	.000000
33	1	9x0000.000	334000.000	9.5405	227.1698	2791.1805	.000000
34	1	9x5000.000	334000.000	9.5122	227.3301	2790.1655	.000000
35	1	10x0000.000	334000.000	9.4935	227.4923	2789.1154	.000000
36	1	10x5000.000	334000.000	9.4868	227.6269	2788.4981	.000000
37	1	11x0000.000	334000.000	9.4916	227.6749	2789.8755	.000000
38	1	11x5000.000	334000.000	9.4136	227.6643	2793.0289	.000000
39	1	12x0000.000	334000.000	9.3771	227.6205	2794.6256	.000000
40	1	12x5000.000	334000.000	9.4306	227.3500	2796.9431	.000000
41	1	13x0000.000	334000.000	9.5563	226.8498	2800.2999	.000000
42	1	13x5000.000	334000.000	9.6897	226.2440	2801.9493	.000000
43	1	14x0000.000	334000.000	9.7732	225.8288	2799.8076	.000000
44	1	14x5000.000	334000.000	9.7732	225.8288	2794.8076	.000000

MASCON WIND FIELD TERRAIN ADJUSTMENT MODEL DATE 061173 PAGE 67

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	2	[illegible]	3420000.000	9.7036	224.6071	2825.0465	.000000
2	2	[illegible]	3420000.000	9.7036	224.8071	2825.0465	.187135-07
3	2	[illegible]	3420000.000	9.6366	224.7657	2832.5677	-.413582-06
4	2	[illegible]	3420000.000	9.5649	224.9054	2836.0960	-.144169-05
5	2	320000.000	3420000.000	9.5658	225.5370	2830.4620	-.295224-05
6	2	330000.000	3420000.000	9.6663	226.6107	2806.0741	-.494996-05
7	2	335000.000	3420000.000	9.7604	227.4931	2784.7942	-.792416-05
8	2	340000.000	3420000.000	9.7837	228.0051	2774.4345	-.978131-05
9	2	345000.000	3420000.000	9.7700	228.4426	2772.0007	-.108476-04
10	2	350000.000	3420000.000	9.6689	228.4219	2781.4559	-.107149-04
11	2	355000.000	3420000.000	9.5560	227.9601	2803.3430	-.797409-05
12	2	360000.000	3420000.000	9.4455	227.4441	2823.2691	-.280619-05
13	2	365000.000	3420000.000	9.4049	227.2417	2829.1864	.136149-05
14	2	370000.000	3420000.000	9.4168	227.2796	2823.5480	.376174-05
15	2	375000.000	3420000.000	9.4546	227.3221	2815.4928	.574693-05
16	2	380000.000	3420000.000	9.5003	227.3319	2808.5199	.755872-05
17	2	385000.000	3420000.000	9.5611	227.3590	2801.3165	.888418-05
18	2	390000.000	3420000.000	9.6321	227.4082	2793.1879	.952141-05
19	2	395000.000	3420000.000	9.7040	227.4576	2784.8949	.939269-05
20	2	400000.000	3420000.000	9.7694	227.4926	2777.4971	.845130-05
21	2	405000.000	3420000.000	9.8216	227.5104	2771.7563	.671041-05
22	2	410000.000	3420000.000	9.8524	227.4996	2768.4720	.440516-05
23	2	415000.000	3420000.000	9.8516	227.4124	2769.0853	.184041-05
24	2	420000.000	3420000.000	9.8158	227.2111	2774.7496	-.625241-06
25	2	425000.000	3420000.000	9.7584	226.9711	2783.0080	-.261855-05
26	2	430000.000	3420000.000	9.7101	226.8197	2789.7424	-.421725-05
27	2	435000.000	3420000.000	9.6513	226.8044	2792.6695	-.561887-05
28	2	440000.000	3420000.000	9.6105	226.8843	2792.9237	-.665619-05
29	2	445000.000	3420000.000	9.5738	227.0148	2792.1605	-.716587-05
30	2	450000.000	3420000.000	9.5408	227.1698	2791.1805	-.716335-05
31	2	455000.000	3420000.000	9.5122	227.3301	2790.1855	-.679570-05
32	2	460000.000	3420000.000	9.4808	227.4923	2789.1154	-.612471-05
33	2	465000.000	3420000.000	9.4600	227.6269	2788.4981	-.522033-05
34	2	470000.000	3420000.000	9.4416	227.6749	2789.6755	-.449539-05
35	2	475000.000	3420000.000	9.4150	227.6043	2793.0269	-.309298-05
36	2	[illegible]	3420000.000	9.3971	227.6205	2794.8256	.311699-05
37	2	[illegible]	3420000.000	9.4306	227.3500	2796.9431	.617793-05
38	2	[illegible]	3420000.000	9.5563	226.8498	2800.2999	.443322-05
39	2	[illegible]	3420000.000	9.6837	226.2440	2800.9493	.170660-05
40	2	[illegible]	3420000.000	9.7702	225.8289	2799.8076	.300692-06
41	2	[illegible]	3420000.000	9.7702	225.3288	2799.8075	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	1	100000.000	3500000.000	9.6379	224.8242	2833.0771	.000000
2	1	150000.000	3500000.000	9.6379	224.8242	2833.0771	.521516-06
3	1	200000.000	3500000.000	9.5272	224.7481	2845.9979	.182674-06
4	1	300000.000	3500000.000	9.3647	224.6257	2862.5535	-.879750-06
5	1	350000.000	3500000.000	9.2569	225.3327	2867.8166	-.267382-05
6	1	400000.000	3500000.000	9.2549	226.3119	2855.3884	-.543385-05
7	1	450000.000	3500000.000	9.3144	227.3659	2836.3454	-.105304-04
8	1	500000.000	3500000.000	9.3606	228.5765	2816.7391	-.133047-04
9	1	550000.000	3500000.000	9.4832	230.2170	2784.6248	-.129242-04
10	1	600000.000	3500000.000	9.6994	232.0760	2740.5415	-.128285-04
11	1	650000.000	3500000.000	9.6963	232.7065	2723.7896	-.234786-05
12	1	700000.000	3500000.000	9.4068	229.7697	2701.0995	.713559-05
13	1	750000.000	3500000.000	9.1307	227.4310	2808.3173	.113469-04
14	1	800000.000	3500000.000	9.1416	227.0869	2822.7929	.123550-04
15	1	850000.000	3500000.000	9.2625	227.3587	2821.0350	.127175-04
16	1	900000.000	3500000.000	9.3356	227.3422	2818.8560	.127322-04
17	1	950000.000	3500000.000	9.3862	227.2282	2815.4428	.124939-04
18	1	1000000.000	3500000.000	9.4355	227.1675	2810.8597	.118341-04
19	1	1050000.000	3500000.000	9.4990	227.2204	2804.4132	.102874-04
20	1	1100000.000	3500000.000	9.5329	227.3785	2797.1064	.819035-05
21	1	1150000.000	3500000.000	9.5609	227.5192	2790.0936	.500921-05
22	1	1200000.000	3500000.000	9.5862	227.7625	2783.4337	.213306-05
23	1	1250000.000	3500000.000	9.5917	228.1483	2773.3787	-.136612-05
24	1	1300000.000	3500000.000	9.5683	228.5997	2766.8994	-.383272-05
25	1	1350000.000	3500000.000	9.4704	228.2967	2772.4439	-.556038-05
26	1	1400000.000	3500000.000	9.3193	227.8267	2785.6805	-.783866-05
27	1	1450000.000	3500000.000	9.2100	227.7954	2794.5629	-.996835-05
28	1	1500000.000	3500000.000	9.1642	228.0937	2795.4588	-.113308-04
29	1	1550000.000	3500000.000	9.1253	228.4869	2800.8974	-.115927-04
30	1	1600000.000	3500000.000	9.0937	228.9111	2801.7232	-.109990-04
31	1	1650000.000	3500000.000	9.0794	229.3354	2802.3528	-.100937-04
32	1	1700000.000	3500000.000	9.0611	229.6367	2803.9515	-.876740-05
33	1	1750000.000	3500000.000	9.0542	230.0536	2801.6559	-.766319-05
34	1	1800000.000	3500000.000	9.1340	230.7062	2795.5054	-.542039-05
35	1	1850000.000	3500000.000	9.1417	230.7585	2796.8908	-.136656-05
36	1	1900000.000	3500000.000	9.1143	231.2321	2804.7290	.607307-05
37	1	1950000.000	3500000.000	9.2074	229.7534	2820.2237	.923477-05
38	1	2000000.000	3500000.000	9.4105	228.7809	2826.2210	.616893-05
39	1	2050000.000	3500000.000	9.6305	227.3970	2819.2419	.188204-05
40	1	2100000.000	3500000.000	9.7446	226.4815	2810.9105	-.157182-06
41	1	2150000.000	3500000.000	9.7446	226.4815	2810.9105	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	4	[illegible]	3540000.000	9.5406	224.8079	2844.4371	.000000
2	4	[illegible]	3540000.000	9.5405	224.8079	2844.4371	.163181-05
3	4	[illegible]	3540000.000	9.3533	224.6559	2866.4621	.168802-05
4	4	[illegible]	3540000.000	9.0317	224.5671	2912.2709	.103672-05
5	4	320000.000	3540000.000	8.7403	224.8275	2947.0551	-.584411-06
6	4	330000.000	3540000.000	6.5541	225.3918	2964.7041	-.391230-05
7	4	335000.000	3540000.000	8.4332	225.8766	2974.6530	-.113084-04
8	4	340000.000	3540000.000	8.2543	226.8928	2989.6554	-.131815-04
9	4	345000.000	3540000.000	8.1546	228.2150	3005.2698	-.651876-05
10	4	350000.000	3540000.000	8.2269	230.2785	3006.7565	-.771155-05
11	4	355000.000	3540000.000	10.0822	240.0961	2863.8677	.137719-04
12	4	360000.000	3540000.000	11.2979	239.5816	2595.2401	.184132-04
13	4	365000.000	3540000.000	9.4853	233.7019	2855.7814	.240631-04
14	4	370000.000	3540000.000	9.0736	227.5175	2886.0127	.239162-04
15	4	375000.000	3540000.000	9.0825	226.9917	2881.1770	.208389-04
16	4	380000.000	3540000.000	9.1290	226.7721	2882.0079	.185135-04
17	4	385000.000	3540000.000	9.1165	226.3801	2886.9000	.165743-04
18	4	390000.000	3540000.000	9.0655	225.9883	2896.4985	.146045-04
19	4	395000.000	3540000.000	8.9651	225.5493	2912.7836	.114991-04
20	4	400000.000	3540000.000	8.8928	225.7042	2929.6931	.829125-05
21	4	405000.000	3540000.000	8.6253	225.9639	2938.2088	.303791-05
22	4	410000.000	3540000.000	8.7130	226.5067	2963.0195	.653774-07
23	4	415000.000	3540000.000	8.5471	226.5306	2961.0067	-.236479-05
24	4	420000.000	3540000.000	8.6162	228.6969	3000.2047	-.436131-05
25	4	425000.000	3540000.000	8.9272	230.9268	2950.6609	-.832681-05
26	4	430000.000	3540000.000	8.6914	230.5305	2963.4621	-.141548-04
27	4	435000.000	3540000.000	8.5192	230.7978	2997.6113	-.173755-04
28	4	440000.000	3540000.000	8.4634	231.6432	2992.7116	-.183642-04
29	4	445000.000	3540000.000	8.4362	232.5919	2989.7772	-.173331-04
30	4	450000.000	3540000.000	8.4106	233.3229	2984.9786	-.150870-04
31	4	455000.000	3540000.000	8.4542	234.2610	2979.3828	-.136715-04
32	4	460000.000	3540000.000	8.5702	235.2512	2959.9430	-.116325-04
33	4	465000.000	3540000.000	8.4444	234.8979	2968.0426	-.984219-05
34	4	470000.000	3540000.000	8.5403	235.9698	2973.4796	-.611843-05
35	4	475000.000	3540000.000	9.0714	237.8024	2905.5177	.174229-05
36	4	480000.000	3540000.000	9.3430	236.4967	2898.0927	.908862-05
37	4	[illegible]	3540000.000	8.9924	234.6009	2928.6746	.125008-04
38	4	[illegible]	3540000.000	9.2972	232.4344	2910.9672	.765424-05
39	4	[illegible]	[illegible]	9.5939	229.3417	2847.6346	.117843-05
40	4	[illegible]	[illegible]	9.7335	227.4058	2824.4864	-.149290-05
41	4	[illegible]	[illegible]	9.7345	227.4058	2824.4864	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	3	100000.000	350000.000	9.4626	224.6666	2852.0190	.000000
2	3	150000.000	350000.000	9.4626	224.6666	2852.0190	.314019-05
3	3	200000.000	350000.000	9.1903	224.4641	2863.7929	.386321-05
4	3	250000.000	350000.000	8.7277	224.2270	2953.2590	.414956-05
5	3	300000.000	350000.000	8.2743	224.1410	3013.1443	.349067-05
6	3	350000.000	350000.000	7.9398	224.1892	3054.6591	.291401-06
7	3	400000.000	350000.000	7.6879	224.1154	3080.4676	-.930289-05
8	3	450000.000	350000.000	7.5030	225.0524	3106.9336	-.550148-05
9	3	500000.000	350000.000	7.4502	226.2738	3123.7161	.814105-05
10	3	550000.000	350000.000	7.5064	228.1982	3113.6201	-.337614-05
11	3	600000.000	350000.000	10.7505	243.7297	2881.7798	.301725-04
12	3	650000.000	350000.000	13.2793	244.2686	2359.0495	.258644-04
13	3	700000.000	350000.000	9.9290	231.0319	2782.2978	.393602-04
14	3	750000.000	350000.000	8.9846	225.2998	2889.1001	.340047-04
15	3	800000.000	350000.000	8.9337	224.9383	2899.5314	.260364-04
16	3	850000.000	350000.000	8.9423	224.9624	2912.6490	.221368-04
17	3	900000.000	350000.000	8.8138	224.4790	2935.7918	.183456-04
18	3	950000.000	350000.000	8.6050	223.9969	2967.1693	.148196-04
19	3	1000000.000	350000.000	8.3436	223.5112	3006.2961	.114551-04
20	3	1050000.000	350000.000	8.1526	223.9182	3041.9966	.805381-05
21	3	1100000.000	350000.000	7.9710	224.5075	3064.8363	.225803-05
22	3	1150000.000	350000.000	7.7723	225.5916	3105.2036	-.631751-06
23	3	1200000.000	350000.000	7.5467	225.9879	3128.7249	.246145-05
24	3	1250000.000	350000.000	7.7752	229.5749	3140.5374	-.242283-05
25	3	1300000.000	350000.000	8.2316	233.2611	3069.3496	-.937148-05
26	3	1350000.000	350000.000	7.8043	233.0069	3116.3167	-.168123-04
27	3	1400000.000	350000.000	7.7037	233.9543	3131.4653	-.183166-04
28	3	1450000.000	350000.000	7.7204	235.5428	3121.1696	-.170460-04
29	3	1500000.000	350000.000	7.7817	237.0542	3114.3011	-.147716-04
30	3	1550000.000	350000.000	7.8258	238.1654	3104.9265	-.116765-04
31	3	1600000.000	350000.000	7.9539	239.4208	3092.3466	-.123001-04
32	3	1650000.000	350000.000	8.1490	240.7030	3062.4581	-.141439-04
33	3	1700000.000	350000.000	7.9902	240.2985	3075.7597	-.931628-05
34	3	1750000.000	350000.000	8.3137	241.4499	3069.9967	-.336925-05
35	3	1800000.000	350000.000	9.2033	243.3977	2955.8154	.382602-05
36	3	1850000.000	350000.000	9.7560	241.5509	2944.7602	.105387-04
37	3	1900000.000	350000.000	8.9150	236.8378	2999.7744	.140495-04
38	3	1950000.000	350000.000	9.3100	235.4169	2965.2215	.718504-05
39	3	2000000.000	350000.000	9.6607	236.7462	2860.0713	-.951211-06
40	3	2050000.000	350000.000	9.8352	237.7801	2820.9614	-.369033-05
41	3	2100000.000	350000.000	9.8352	237.7801	2820.9614	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
4	3	1e0000.000	3570000.000	9.4292	224.4006	2852.8770	.000000
5	3	1e0000.000	3570000.000	9.4292	224.4006	2852.8770	.501409-05
3	6	2e0000.000	3570000.000	9.3915	224.1875	2892.8349	.670659-05
4	3	3e0000.000	3570000.000	8.5265	223.8217	2978.4284	.854585-05
5	6	4e0000.000	3570000.000	7.9915	223.4544	3051.8921	.966849-05
6	3	5e0000.000	3570000.000	7.6478	223.2555	3093.7204	.120769-04
7	6	6e0000.000	3570000.000	7.4877	223.2803	3108.8285	.170633-05
8	3	7e0000.000	3570000.000	7.1490	225.1301	3149.8969	-.608563-05
9	3	8e0000.000	3570000.000	7.3801	224.1981	3145.4397	.266013-04
10	6	9e0000.000	3570000.000	7.4427	224.8810	3124.6506	-.836892-05
11	6	1e5000.000	3570000.000	11.0049	244.3791	2880.9592	.352235-04
12	6	1e0000.000	3570000.000	14.6469	246.3590	2197.7381	.358131-04
13	3	1e5000.000	3570000.000	10.1839	230.1903	2713.5499	.817114-04
14	3	2e0000.000	3570000.000	8.6535	225.0787	2908.4280	.587706-04
15	6	2e5000.000	3570000.000	6.5893	223.2278	2928.9828	.411535-04
16	3	3e0000.000	3570000.000	8.5029	223.7107	2962.0417	.315852-04
17	6	3e5000.000	3570000.000	8.1989	225.4470	3013.6607	.235523-04
18	3	4e0000.000	3570000.000	7.8297	223.2917	3071.0643	.183364-04
19	6	4e5000.000	3570000.000	7.4530	223.2170	3130.2909	.188686-04
20	6	5e0000.000	3570000.000	7.2535	223.8375	3170.8926	.159226-04
21	3	5e5000.000	3570000.000	7.0479	224.9019	3197.2862	.145721-04
22	3	6e0000.000	3570000.000	6.9259	226.4135	3231.6770	.105409-04
23	6	6e5000.000	3570000.000	6.6663	227.7799	3259.6269	.147631-04
24	3	7e0000.000	3570000.000	7.1567	231.3154	3244.3641	.890393-05
25	3	7e5000.000	3570000.000	7.5906	236.1914	3170.6520	-.150203-05
26	3	8e0000.000	3570000.000	7.2760	236.2549	3213.9077	-.466150-05
27	3	8e5000.000	3570000.000	7.1906	237.4050	3218.6832	-.791974-05
28	3	9e0000.000	3570000.000	7.2768	238.9530	3199.0563	-.823447-05
29	3	9e5000.000	3570000.000	7.4116	239.9374	3184.5821	-.725942-05
30	3	1e0000.000	3570000.000	7.4921	240.0613	3170.9564	-.754597-05
31	3	1e5000.000	3570000.000	7.7161	242.0142	3148.3130	-.684028-05
32	6	2e0000.000	3570000.000	8.0196	243.9401	3104.7494	-.145733-04
33	3	2e5000.000	3570000.000	7.8019	244.8747	3129.5775	-.893245-05
34	3	3e0000.000	3570000.000	8.5313	244.0316	3095.7348	.322265-06
35	3	3e5000.000	3570000.000	9.5009	244.6184	2953.4973	-.285929-05
36	3	4e0000.000	3570000.000	9.1493	243.8357	2965.9695	.677341-05
37	3	4e5000.000	3570000.000	9.7490	240.5401	3019.6975	.135457-04
38	3	5e0000.000	3570000.000	9.5106	236.1497	2967.3969	.406545-05
39	3	5e5000.000	3570000.000	9.3924	230.5409	2835.0426	-.468419-05
40	3	6e0000.000	3570000.000	10.0732	227.0528	2767.5548	-.665094-05
41	3	6e5000.000	3570000.000	10.0732	227.0528	2767.5548	.000000

** WIND FIELDS, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

I	J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	7	[illegible]	3575000.000	9.4111	224.1601	2851.9786	.000000
2	7	[illegible]	3575000.000	9.4111	224.1601	2851.9786	.755945-05
3	7	[illegible]	3575000.000	9.0326	223.9063	2896.4842	.105825-04
4	7	[illegible]	3575000.000	8.4006	223.4753	2991.1309	.139025-04
5	7	[illegible]	3575000.000	7.8336	222.8360	3068.7532	.155875-04
6	7	[illegible]	3575000.000	7.5212	221.6968	3110.1408	.130760-04
7	7	[illegible]	3575000.000	7.1156	220.0526	3159.8359	.214280-04
8	7	[illegible]	3575000.000	7.5803	222.2246	3118.3499	.979418-05
9	7	[illegible]	3575000.000	7.7362	223.1612	3093.7733	.193386-04
10	7	[illegible]	3575000.000	7.6120	221.0144	3119.7139	.380786-04
11	7	[illegible]	3575000.000	11.1193	244.2638	2887.7846	.517085-05
12	7	[illegible]	3575000.000	15.2113	247.6589	2111.5345	.120101-03
13	7	[illegible]	3575000.000	9.3576	229.9719	2731.0289	.239748-03
14	7	[illegible]	3575000.000	7.5273	222.7824	3014.6630	.175986-03
15	7	[illegible]	3575000.000	7.9321	223.2135	3001.2274	.120259-03
16	7	[illegible]	3575000.000	7.7208	224.1943	3054.7084	.760770-04
17	7	[illegible]	3575000.000	7.5930	224.1471	3120.1172	.575259-04
18	7	[illegible]	3575000.000	7.0545	224.1174	3175.0088	.411465-04
19	7	[illegible]	3575000.000	6.7593	224.6934	3224.8187	.387376-04
20	7	[illegible]	3575000.000	6.7497	224.8136	3237.0726	.316034-04
21	7	[illegible]	3575000.000	6.5646	225.5185	3257.5523	.301884-04
22	7	[illegible]	3575000.000	6.4430	225.9065	3266.6154	.265592-04
23	7	[illegible]	3575000.000	6.3849	226.1131	3269.6148	.204273-04
24	7	[illegible]	3575000.000	6.9219	231.1535	3254.6069	.235566-04
25	7	[illegible]	3575000.000	7.1926	236.1368	3206.5227	.950165-05
26	7	[illegible]	3575000.000	7.0134	236.3385	3229.7316	.114103-04
27	7	[illegible]	3575000.000	6.9963	237.6397	3226.5338	.575350-05
28	7	[illegible]	3575000.000	7.2376	240.0543	3191.5134	-.106245-05
29	7	[illegible]	3575000.000	7.3709	241.4081	3179.3049	-.837293-05
30	7	[illegible]	3575000.000	7.4941	242.2540	3167.3185	-.869326-05
31	7	[illegible]	3575000.000	7.5834	243.1583	3146.4090	-.356192-05
32	7	[illegible]	3575000.000	7.6416	244.9692	3150.8987	.553349-05
33	7	[illegible]	3575000.000	8.0171	247.2460	3156.4770	-.127511-04
34	7	[illegible]	3575000.000	9.3307	243.9154	2995.4189	-.748546-05
35	7	[illegible]	3575000.000	9.6116	245.1222	2924.3531	-.116174-04
36	7	[illegible]	3575000.000	9.0895	245.0124	2962.8110	.112755-04
37	7	[illegible]	3575000.000	9.2239	240.9217	2999.0908	.126116-04
38	7	[illegible]	3575000.000	9.7334	235.8946	2941.8537	-.119422-05
39	7	[illegible]	3575000.000	10.1978	229.4213	2790.8578	-.959586-05
40	7	[illegible]	3575000.000	10.3334	226.0054	2746.8873	-.102450-04
41	7	[illegible]	3575000.000	10.3334	226.0054	2746.8873	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (5.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	1	100000.000	3580000.000	9.3746	223.9520	2853.5653	.000000
2	2	150000.000	3580000.000	9.3746	223.9520	2853.5653	.903944-05
3	3	200000.000	3580000.000	8.9785	223.4648	2898.5776	.122027-04
4	4	250000.000	3580000.000	8.2520	223.1065	3008.1719	.141747-04
5	5	300000.000	3580000.000	7.6943	222.3207	3089.0383	.125382-04
6	6	350000.000	3580000.000	7.5193	220.7817	3117.1686	.624553-05
7	6	400000.000	3580000.000	7.6294	220.8526	3124.5103	-.124978-05
8	6	450000.000	3580000.000	8.1594	219.5301	3050.0957	.255086-04
9	6	500000.000	3580000.000	8.0399	218.5257	3096.1508	.777513-05
10	6	550000.000	3580000.000	7.7244	211.6708	3143.2553	-.557990-04
11	6	600000.000	3580000.000	12.7103	231.1756	2742.1143	-.237140-03
12	6	650000.000	3580000.000	14.3447	249.1574	2058.7470	.303995-03
13	6	700000.000	3580000.000	8.7946	229.5164	2892.8089	.349586-03
14	6	750000.000	3580000.000	8.2115	219.0469	3071.9234	.282498-03
15	6	800000.000	3580000.000	8.8798	223.0379	3050.4172	.196874-03
16	6	850000.000	3580000.000	8.7875	223.1122	3148.8072	.137346-03
17	6	900000.000	3580000.000	8.5848	223.4606	3192.4805	.102304-03
18	6	950000.000	3580000.000	8.5571	222.9145	3222.0219	.581487-04
19	6	1000000.000	3580000.000	8.2918	224.7542	3274.9845	.453091-04
20	6	1050000.000	3580000.000	8.4533	224.1508	3269.2004	.422101-04
21	6	1100000.000	3580000.000	8.2698	224.1629	3266.0524	.332603-04
22	5	100000.000	3580000.000	8.2522	224.9144	3298.4241	.296501-04
23	5	150000.000	3580000.000	8.3032	226.7675	3278.3316	.179324-04
24	5	200000.000	3580000.000	8.5424	231.1549	3286.2221	.145089-04
25	5	250000.000	3580000.000	7.0336	234.8050	3213.5762	.108679-04
26	5	300000.000	3580000.000	8.7498	236.3300	3228.3243	.367550-05
27	5	350000.000	3580000.000	8.7384	236.1068	3234.6600	.680091-05
28	5	400000.000	3580000.000	8.8309	240.8783	3213.3471	.517607-05
29	5	450000.000	3580000.000	7.1323	243.2640	3198.4119	.555825-05
30	5	500000.000	3580000.000	7.2077	245.1020	3181.6999	-.404840-05
31	5	550000.000	3580000.000	7.2330	245.9597	3202.3808	.308073-05
32	5	600000.000	3580000.000	7.3542	246.0490	3216.3667	-.819308-06
33	5	650000.000	3580000.000	8.9038	243.9661	3059.0237	.537651-05
34	5	700000.000	3580000.000	9.5916	244.9219	2933.2204	-.214491-05
35	5	750000.000	3580000.000	9.2034	246.4223	3015.8584	-.226048-05
36	5	800000.000	3580000.000	9.2687	244.8791	2981.2753	.204991-04
37	5	850000.000	3580000.000	9.5399	240.5792	2975.1807	.143614-04
38	5	900000.000	3580000.000	10.0420	235.4803	2923.5839	-.124036-05
39	5	950000.000	3580000.000	10.4923	228.8548	2750.9358	-.107683-04
40	5	1000000.000	3580000.000	10.5538	225.3651	2717.2184	-.117273-04
41	5	1050000.000	3580000.000	10.5538	225.3651	2717.2184	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	9	1000e0.000	35e5000.000	9.3240	223.7828	2857.2843	.000000
2	9	1e0000.000	35e5000.000	9.3240	223.7828	2857.2843	.100304-04
3	9	2e0000.000	35e5000.000	8.9492	222.8094	2896.2784	.124733-04
4	9	3e0000.000	35e5000.000	8.1003	222.7675	3029.5456	.112351-04
5	9	3e0000.000	35e5000.000	7.6026	222.0327	3109.9677	.376412-05
6	9	3e0000.000	35e5000.000	7.5625	221.3381	3129.5858	-.468367-05
7	9	3e5000.000	35e5000.000	7.9972	221.0955	3092.8206	.109097-04
8	9	4e0000.000	35e5000.000	8.3482	220.5325	3067.8965	.291669-04
9	9	4e5000.000	35e5000.000	8.6950	219.1931	3049.7159	-.151879-04
10	9	5e0000.000	35e5000.000	10.2226	225.0584	2885.4371	-.231295-04
11	9	5e5000.000	35e5000.000	14.8828	227.1887	2306.0805	-.211798-03
12	9	6e0000.000	35e5000.000	8.7931	236.1389	2559.2e75	-.141581-03
13	9	6e5000.000	35e5000.000	4.6506	226.7930	3005.1566	.771924-05
14	9	7e0000.000	35e5000.000	4.9052	216.3169	3082.5488	.168957-03
15	9	7e5000.000	35e5000.000	5.4326	221.1309	3135.0359	.188449-03
16	9	8e0000.000	35e5000.000	5.3555	220.9281	3189.5465	.168909-03
17	9	8e5000.000	35e5000.000	5.9951	221.5123	3222.7824	.139183-03
18	9	9e0000.000	35e5000.000	6.1173	220.2802	3247.3213	.929172-04
19	9	9e5000.000	35e5000.000	5.9631	223.9189	3296.1514	.515613-04
20	9	1e0000.000	35e5000.000	6.4409	222.6625	3257.0230	.517773-04
21	9	1e5000.000	35e5000.000	6.1356	222.5357	3284.5916	.219715-04
22	9	1100e0.000	35e5000.000	6.0615	223.2169	3296.4748	.331966-04
23	9	1150e0.000	35e5000.000	6.0399	224.7207	3293.2266	.380860-04
24	9	1200e0.000	35e5000.000	6.3822	231.3376	3275.5891	-.969439-06
25	9	1250e0.000	35e5000.000	6.7445	234.9915	3216.9471	.112475-04
26	9	1300e0.000	35e5000.000	6.2735	237.7517	3264.7111	-.240535-05
27	9	1350e0.000	35e5000.000	6.2914	240.6102	3277.7795	.157013-04
28	9	1400e0.000	35e5000.000	6.6242	242.3591	3231.3470	.321153-05
29	9	1450e0.000	35e5000.000	6.6814	245.1274	3222.3891	-.836015-05
30	9	1500e0.000	35e5000.000	6.9463	247.1668	3211.9742	.188811-05
31	9	1550e0.000	35e5000.000	6.8819	249.4168	3241.2100	.151913-05
32	9	1600e0.000	35e5000.000	6.2702	248.8583	3140.1579	.607836-05
33	9	1650e0.000	35e5000.000	9.8782	243.4242	2925.8210	.199960-04
34	9	1700e0.000	35e5000.000	9.3869	243.3608	2980.7138	-.353733-05
35	9	1750e0.000	35e5000.000	9.3802	246.6463	3009.6140	.948926-05
36	9	1800e0.000	35e5000.000	9.9267	242.5536	2909.1561	.242826-04
37	9	1850e0.000	35e5000.000	9.9837	238.5958	2917.7960	.159854-04
38	9	1900e0.000	35e5000.000	10.8110	234.2147	2881.1099	-.446189-06
39	9	1950e0.000	35e5000.000	10.7550	228.0322	2712.5482	-.111396-04
40	9	2000e0.000	35e5000.000	10.7752	224.7431	2687.3387	-.126025-04
41	9	2050e0.000	35e5000.000	10.7752	224.7431	2687.3387	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	10	100000.000	3590000.000	9.2620	223.6728	2863.3120	.000000
2	10	180000.000	3590000.000	9.2620	223.6728	2863.3120	.104436-04
3	10	260000.000	3590000.000	6.9309	222.0691	2891.9985	.119539-04
4	10	300000.000	3590000.000	8.9618	221.8016	3043.0832	.823323-05
5	10	320000.000	3590000.000	7.7006	221.0127	3114.5013	-.310478-05
6	10	330000.000	3590000.000	7.7692	221.6308	3122.2500	-.130633-04
7	10	335000.000	3590000.000	8.3572	221.5970	3051.2115	.103420-04
8	10	340000.000	3590000.000	8.5726	221.5765	3033.9784	.567811-05
9	10	345000.000	3590000.000	8.9124	223.2294	3031.3126	.221522-04
10	10	350000.000	3590000.000	10.3247	227.9165	2632.4517	-.178252-04
11	10	355000.000	3590000.000	10.5576	243.4645	2876.2423	-.135086-03
12	10	360000.000	3590000.000	8.6174	240.3173	2879.9845	-.386862-03
13	10	365000.000	3590000.000	5.3881	234.7781	3066.8284	-.239130-03
14	10	370000.000	3590000.000	4.6096	222.7695	3177.4396	-.409028-04
15	10	375000.000	3590000.000	4.9553	222.5375	3186.6625	.859911-04
16	10	380000.000	3590000.000	5.1763	220.2863	3215.6018	.132706-03
17	10	385000.000	3590000.000	5.4707	219.0853	3248.0069	.135910-03
18	10	390000.000	3590000.000	5.6565	216.2124	3276.9062	.121892-03
19	10	395000.000	3590000.000	6.1834	220.1106	3236.8832	.734331-04
20	10	400000.000	3590000.000	6.3367	221.5544	3229.6397	.521447-04
21	10	405000.000	3590000.000	5.9084	220.4020	3305.5829	.328293-04
22	10	410000.000	3590000.000	5.7923	221.6967	3316.2103	.227377-04
23	10	415000.000	3590000.000	5.5902	222.5641	3332.9716	.278964-04
24	10	420000.000	3590000.000	6.2285	228.7509	3253.1255	.136834-04
25	10	425000.000	3590000.000	5.9869	236.5853	3273.2664	.134088-05
26	10	430000.000	3590000.000	5.7419	236.4469	3337.5714	.179791-05
27	10	435000.000	3590000.000	5.9584	242.5972	3305.5983	-.967664-05
28	10	440000.000	3590000.000	6.5971	241.7770	3234.6255	.257624-04
29	10	445000.000	3590000.000	6.5885	247.2471	3238.7758	.371564-05
30	10	450000.000	3590000.000	6.5072	250.4335	3270.6909	.431602-05
31	10	455000.000	3590000.000	7.7283	247.5217	3202.4722	.951499-05
32	10	460000.000	3590000.000	9.6279	244.2404	2948.7292	.297108-05
33	10	465000.000	3590000.000	9.5831	243.4007	2943.6460	.149037-04
34	10	470000.000	3590000.000	9.0475	243.7179	3047.5252	.140907-04
35	10	475000.000	3590000.000	9.8186	246.3234	2952.7589	.313525-04
36	10	480000.000	3590000.000	10.4132	241.5603	2831.3698	.239674-04
37	10	490000.000	3590000.000	10.2027	238.8016	2897.0429	.162354-04
38	10	510000.000	3590000.000	10.5597	233.9759	2863.3735	-.109797-05
39	10	550000.000	3590000.000	10.9959	227.5918	2675.7655	-.123980-04
40	10	630000.000	3590000.000	11.0209	224.0659	2654.1479	-.135415-04
41	10	710000.000	3590000.000	11.0209	224.0659	2654.1479	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (5.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	11	100000.000	3595000.000	9.2090	223.5838	2870.2609	.000000
2	11	190000.000	3595000.000	9.2090	223.5838	2870.2609	.101371-04
3	11	260000.000	3595000.000	8.8618	221.7819	2894.1284	.100498-04
4	11	300000.000	3595000.000	8.2895	219.5808	3028.3329	.479587-05
5	11	320000.000	3595000.000	8.1403	218.3776	3079.2355	-.412900-05
6	11	330000.000	3595000.000	8.3590	220.4077	3061.3252	-.978341-05
7	11	335000.000	3595000.000	8.5245	221.9049	3023.0253	.230513-05
8	11	340000.000	3595000.000	8.2623	222.1029	3071.9480	-.520744-05
9	11	345000.000	3595000.000	8.2367	224.5641	3086.1403	-.535231-05
10	11	350000.000	3595000.000	8.0505	225.1745	3105.9618	.374618-04
11	11	355000.000	3595000.000	10.0135	241.6284	3011.1777	-.357616-04
12	11	360000.000	3595000.000	10.6142	246.4194	2702.7391	-.203832-03
13	11	365000.000	3595000.000	7.0339	234.1650	3084.8313	-.208127-03
14	11	370000.000	3595000.000	5.4221	224.2588	3213.7335	-.122492-03
15	11	375000.000	3595000.000	4.8737	222.2888	3213.6143	-.118452-04
16	11	380000.000	3595000.000	4.9492	219.9481	3230.5970	.721770-04
17	11	385000.000	3595000.000	5.2629	217.8535	3252.1080	.982841-04
18	11	390000.000	3595000.000	5.4737	216.0175	3274.7604	.990324-04
19	11	395000.000	3595000.000	6.0483	216.2915	3212.8994	.936197-04
20	11	400000.000	3595000.000	5.7500	218.9372	3261.1011	.647152-04
21	11	405000.000	3595000.000	5.5466	217.8418	3321.4734	.573090-04
22	11	410000.000	3595000.000	5.4839	220.2215	3317.8562	.264006-04
23	11	415000.000	3595000.000	5.3857	224.1703	3324.5088	.253255-04
24	11	420000.000	3595000.000	5.5251	226.7803	3313.6165	.475979-04
25	11	425000.000	3595000.000	5.2508	237.0018	3327.9807	-.133926-04
26	11	430000.000	3595000.000	5.3722	241.7673	3337.7123	.720723-05
27	11	435000.000	3595000.000	6.2650	244.4212	3240.8189	-.306188-04
28	11	440000.000	3595000.000	5.8838	247.0077	3292.8290	-.195482-04
29	11	445000.000	3595000.000	5.7384	243.3009	3346.9135	.568253-04
30	11	450000.000	3595000.000	7.3717	240.6014	3172.6977	.175513-04
31	11	455000.000	3595000.000	9.0049	240.2166	3011.3163	-.745509-05
32	11	460000.000	3595000.000	9.3049	245.3684	2942.7207	-.607556-06
33	11	465000.000	3595000.000	9.3601	242.7510	2993.1761	.113425-04
34	11	470000.000	3595000.000	9.1350	240.7557	3016.5874	.859193-05
35	11	475000.000	3595000.000	10.3930	242.8834	2876.0431	.410693-05
36	11	480000.000	3595000.000	10.7102	241.9414	2767.6145	.178635-04
37	11	485000.000	3595000.000	10.3178	238.8574	2904.0051	.224468-04
38	11	490000.000	3595000.000	10.8839	235.6763	2856.0241	.454727-05
39	11	495000.000	3595000.000	11.3012	226.9545	2831.6425	-.114107-04
40	11	500000.000	3595000.000	11.2994	223.3175	2616.4085	-.142112-04
41	11	505000.000	3595000.000	11.2994	223.3175	2616.4085	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	12	100000.000	3600000.000	9.1533	223.4154	2874.7415	.000000
2	12	100000.000	3600000.000	9.1533	223.4154	2874.7415	.935487-05
3	12	200000.000	3600000.000	8.7588	222.0176	2902.4736	.852485-05
4	12	300000.000	3600000.000	8.3644	219.2122	3015.0033	.377528-05
5	12	320000.000	3600000.000	8.1950	218.3672	3059.6298	-.197703-05
6	12	330000.000	3600000.000	8.2050	219.6391	3056.1617	-.123639-05
7	12	335000.000	3600000.000	7.9722	221.5748	3078.8948	-.330771-05
8	12	340000.000	3600000.000	7.9445	222.1578	3105.0280	-.405504-05
9	12	345000.000	3600000.000	7.9281	225.2931	3097.6149	.424463-05
10	12	350000.000	3600000.000	8.2900	228.1818	3070.1461	.372061-04
11	12	355000.000	3600000.000	9.9571	237.2459	2932.4712	.305270-04
12	12	360000.000	3600000.000	10.3372	243.9637	2787.7392	-.955172-04
13	12	365000.000	3600000.000	7.5965	233.6736	3060.3376	-.110908-03
14	12	370000.000	3600000.000	5.7714	221.7571	3234.3900	-.120246-03
15	12	375000.000	3600000.000	5.0412	221.0679	3234.2719	-.685574-04
16	12	380000.000	3600000.000	5.0049	219.3799	3238.8085	.155492-04
17	12	385000.000	3600000.000	5.1326	217.1480	3257.9826	.581421-04
18	12	390000.000	3600000.000	5.2053	216.1520	3270.6544	.836278-04
19	12	395000.000	3600000.000	5.4603	214.4567	3281.0636	.862055-04
20	12	400000.000	3600000.000	5.2053	216.0231	3305.3737	.609735-04
21	12	405000.000	3600000.000	5.1591	215.1636	3328.8081	.562422-04
22	12	410000.000	3600000.000	5.0592	217.3849	3335.6800	.287444-04
23	12	415000.000	3600000.000	4.8226	220.3795	3354.4563	.295628-04
24	12	420000.000	3600000.000	4.6648	223.4285	3390.7061	.494599-04
25	12	425000.000	3600000.000	4.9905	231.3388	3340.2887	.374811-04
26	12	430000.000	3600000.000	5.1806	244.1684	3347.0011	-.184344-04
27	12	435000.000	3600000.000	6.0240	242.6865	3293.1523	.172055-04
28	12	440000.000	3600000.000	6.2471	248.2487	3266.8297	-.306983-04
29	12	445000.000	3600000.000	6.8034	244.4765	3244.6051	-.463497-04
30	12	450000.000	3600000.000	7.6941	242.0861	3172.1893	.398108-05
31	12	455000.000	3600000.000	9.1382	246.4130	3059.7958	.344107-04
32	12	460000.000	3600000.000	10.6340	244.8250	2872.9614	-.264927-05
33	12	465000.000	3600000.000	9.9673	242.3829	2919.5708	-.312866-05
34	12	470000.000	3600000.000	9.8902	239.7815	2949.1951	.165614-04
35	12	475000.000	3600000.000	10.7713	242.2199	2835.3881	.657797-06
36	12	480000.000	3600000.000	10.3266	240.0763	2816.1033	.342790-04
37	12	490000.000	3600000.000	10.1995	240.6046	2694.5916	.342932-04
38	12	510000.000	3600000.000	11.0126	234.2769	2837.1668	.954422-05
39	12	530000.000	3600000.000	11.7392	225.5721	2564.8477	-.965426-05
40	12	610000.000	3600000.000	11.5932	222.5366	2576.2856	-.135915-04
41	12	710000.000	3600000.000	11.5932	222.5366	2576.2856	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	13	100000.000	3605000.000	9.1279	223.1289	2874.9834	.000000
2	13	105000.000	3605000.000	9.1279	223.1289	2874.9834	.856115-05
3	13	200000.000	3605000.000	8.6785	221.9846	2908.5369	.792325-05
4	13	300000.000	3605000.000	8.1370	220.0001	3052.0646	.468322-05
5	13	350000.000	3605000.000	7.3186	219.9406	3115.0825	.133374-05
6	13	330000.000	3605000.000	7.7770	221.2070	3124.9257	-.181349-05
7	13	335000.000	3605000.000	7.7059	222.6730	3116.4383	-.103032-04
8	13	340000.000	3605000.000	7.6107	222.9911	3123.8445	-.106655-04
9	13	345000.000	3605000.000	7.6941	225.0965	3134.4996	-.133312-04
10	13	350000.000	3605000.000	7.3951	224.1110	3134.0166	-.739328-05
11	13	355000.000	3605000.000	9.0166	230.4226	3118.8487	.297853-04
12	13	360000.000	3605000.000	10.9899	243.0446	2807.0004	.798420-05
13	13	365000.000	3605000.000	8.2638	232.8032	3008.3268	.337307-05
14	13	370000.000	3605000.000	6.0856	224.7879	3255.6957	-.384188-04
15	13	375000.000	3605000.000	5.4130	220.6773	3293.5862	-.319743-04
16	13	380000.000	3605000.000	5.2656	218.9858	3257.5786	-.202623-06
17	13	385000.000	3605000.000	5.1005	215.7912	3275.7673	.309443-04
18	13	390000.000	3605000.000	5.0065	213.9860	3282.1827	.635904-04
19	13	395000.000	3605000.000	5.0990	212.2982	3313.0361	.662796-04
20	13	400000.000	3605000.000	4.9961	212.9070	3309.6295	.542595-04
21	13	405000.000	3605000.000	4.9500	212.3718	3323.9182	.473081-04
22	13	410000.000	3605000.000	4.8060	214.3222	3343.8848	.323427-04
23	13	415000.000	3605000.000	4.6474	217.4340	3347.4414	.348135-04
24	13	420000.000	3605000.000	4.4984	221.3077	3369.1909	.462825-04
25	13	425000.000	3605000.000	4.1244	224.7491	3396.4806	.569083-04
26	13	430000.000	3605000.000	3.2864	239.8347	3319.5739	.327979-05
27	13	435000.000	3605000.000	6.2242	242.6162	3257.7108	-.216963-04
28	13	440000.000	3605000.000	6.5263	244.4595	3257.1163	-.186851-04
29	13	445000.000	3605000.000	7.4485	245.8614	3179.7913	-.252773-04
30	13	450000.000	3605000.000	8.2152	245.1067	3138.0504	-.152069-04
31	13	455000.000	3605000.000	9.9624	244.3609	2979.4225	.235138-04
32	13	460000.000	3605000.000	11.1434	242.7399	2774.6054	.215490-04
33	13	465000.000	3605000.000	9.9360	245.0542	2914.5654	.200967-04
34	13	470000.000	3605000.000	9.6284	238.4476	2955.3603	-.344245-05
35	13	475000.000	3605000.000	9.9948	238.2539	2948.5153	-.718493-05
36	13	480000.000	3605000.000	10.4219	240.8990.	2859.5656	.251458-04
37	13	485000.000	3605000.000	11.1765	235.2075	2833.9527	.331967-04
38	13	490000.000	3605000.000	11.9926	230.3303	2765.7981	.127593-04
39	13	495000.000	3605000.000	12.3025	225.9067,	2476.1336	-.585313-05
40	13	500000.000	3605000.000	11.8930	221.9363	2543.4858	-.119154-04
41	13	705000.000	3605000.000	11.6330	221.9363	2543.4858	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	14	100000.000	3610000.000	9.1197	222.7645	2871.8103	.000000
2	14	180000.000	3610000.000	9.1197	222.7645	2871.8103	.790805-05
3	14	260000.000	3610000.000	8.6625	221.5702	2908.5193	.747004-05
4	14	340000.000	3610000.000	8.0621	219.8407	3054.6898	.506773-05
5	14	420000.000	3610000.000	7.7116	219.8926	3118.8681	.182723-05
6	14	500000.000	3610000.000	7.6544	221.1136	3128.8082	-.323107-05
7	14	580000.000	3610000.000	7.5992	222.2944	3121.1253	-.863320-05
8	14	660000.000	3610000.000	7.5202	223.0899	3128.4737	-.104892-04
9	14	740000.000	3610000.000	7.6628	225.9333	3130.0542	.795134-05
10	14	820000.000	3610000.000	7.9050	227.2795	3064.8180	-.127981-04
11	14	900000.000	3610000.000	9.1033	238.3355	3060.8795	-.256741-04
12	14	980000.000	3610000.000	11.0688	236.3967	2711.8418	.874129-04
13	14	1060000.000	3610000.000	7.1705	229.1490	3043.5818	.770641-04
14	14	1140000.000	3610000.000	5.2884	219.1250	3341.0885	.951170-04
15	14	1220000.000	3610000.000	5.5894	217.5362	3273.8726	.500802-04
16	14	1300000.000	3610000.000	5.4257	216.2662	3259.3493	.123151-04
17	14	1380000.000	3610000.000	5.1977	213.2307	3285.0121	.203477-04
18	14	1460000.000	3610000.000	5.0641	210.9951	3287.2036	.371117-04
19	14	1540000.000	3610000.000	5.0188	209.5233	3303.4216	.454935-04
20	14	1620000.000	3610000.000	4.9262	209.0147	3306.7291	.461131-04
21	14	1700000.000	3610000.000	4.7836	208.3673	3331.5827	.389334-04
22	14	1780000.000	3610000.000	4.5904	209.4213	3350.8758	.386786-04
23	14	1860000.000	3610000.000	4.3821	210.2289	3360.1550	.303403-04
24	14	1940000.000	3610000.000	3.7781	211.6560	3424.7132	.342659-04
25	14	2020000.000	3610000.000	3.7524	223.8004	3421.4300	.733621-05
26	14	2100000.000	3610000.000	5.5351	235.1881	3309.5063	.432948-04
27	14	2180000.000	3610000.000	6.1931	247.6428	3277.1328	-.164429-04
28	14	2260000.000	3610000.000	6.5022	252.6294	3289.8828	.673608-05
29	14	2340000.000	3610000.000	7.6153	247.4524	3192.9157	.220444-04
30	14	2420000.000	3610000.000	9.1005	243.1894	3063.6000	.147095-05
31	14	2500000.000	3610000.000	11.0082	242.7272	2859.7500	-.537637-05
32	14	2580000.000	3610000.000	10.8441	241.7855	2815.1315	.182723-04
33	14	2660000.000	3610000.000	10.1670	237.4125	2945.1671	.186373-04
34	14	2740000.000	3610000.000	11.1025	236.9481	2814.0781	.761533-05
35	14	2820000.000	3610000.000	11.8820	234.1588	2746.2723	-.185891-05
36	14	2900000.000	3610000.000	12.4190	233.1492	2615.8157	.360690-04
37	14	2980000.000	3610000.000	12.8191	227.2720	2556.1241	.230039-04
38	14	3060000.000	3610000.000	13.1905	224.3899	2545.3429	.647636-05
39	14	3140000.000	3610000.000	12.5927	222.7272	2415.5300	-.416225-05
40	14	3220000.000	3610000.000	11.9368	221.7705	2528.6012	-.983127-05
41	14	3300000.000	3610000.000	11.9368	221.7705	2528.6012	.886700

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	15	1e0000.000	3615000.000	9.1251	222.3544	2866.6118	.000000
2	15	1e0000.000	3615000.000	9.1251	222.3544	2866.6118	.733376-05
3	15	2e0000.000	3615000.000	8.6659	221.0278	2906.0916	.701363-05
4	15	3e0000.000	3615000.000	8.0405	219.2357	3056.1795	.494505-05
5	15	3200e0.000	3615000.000	7.6902	219.1968	3123.0123	.192042-05
6	15	330000.000	3615000.000	7.6340	220.5067	3129.5850	-.165537-05
7	15	335000.000	3615000.000	7.5677	221.7020	3128.4057	-.934768-05
8	15	340000.000	3615000.000	7.4167	222.[illegible]12	3143.9346	-.187575-04
9	15	345000.000	3615000.000	7.4146	224.9806	3158.4393	.178534-04
10	15	350000.000	3615000.000	7.1053	221.6778	3153.0305	.670475-04
11	15	355000.000	3615000.000	9.607	242.6334	3071.7971	-.607807-04
12	15	360000.000	3615000.000	10.3700	238.4091	2686.6994	.965319-04
13	15	365000.000	3615000.000	5.1377	227.5121	3343.8580	.110346-03
14	15	370000.000	3615000.000	5.0798	217.7327	3332.3725	.164746-03
15	15	375000.000	3615000.000	5.6367	215.8274	3253.6782	.106357-03
16	15	380000.000	3615000.000	5.5533	213.9272	3274.1169	.437333-04
17	15	385000.000	3615000.000	5.3548	210.84[illegible]	3291.8868	.294782-04
18	15	390000.000	3615000.000	5.1825	208.1743	3291.4188	.244441-04
19	15	395000.000	3615000.000	4.9669	206.7614	3310.5234	.265078-04
20	15	400000.000	3615000.000	4.8948	205.3430	3317.5850	.310879-04
21	15	405000.000	3615000.000	4.7106	204.5429	3336.8783	.189181-04
22	15	410000.000	3615000.000	4.5213	204.3695	3331.5677	.536352-04
23	15	415000.000	3615000.000	4.2320	204.1867	3382.5772	.385679-04
24	15	420000.000	3615000.000	3.2441	209.2153	3434.0257	-.840450-04
25	15	425000.000	3615000.000	3.9116	225.1696	3381.2510	-.811316-05
26	15	430000.000	3615000.000	4.6960	233.8723	3357.3821	.272674-04
27	15	435000.000	3615000.000	4.9153	245.7744	3363.3665	.418165-04
28	15	440000.000	3615000.000	6.8926	247.6988	3277.8616	.723513-[illegible]
29	15	445000.000	3615000.000	9.7032	243.6781	3013.4135	.331043-0[illegible]
30	15	450000.000	3615000.000	10.0942	240.4221	2860.4315	-.762140-0[illegible]
31	15	455000.000	3615000.000	11.7016	239.2592	2768.0482	-.104403-04
32	15	460000.000	3615000.000	11.7011	240.1814	2727.6301	.200097-04
33	15	465000.000	3615000.000	12.0085	243.0117	2675.9772	-.772293-05
34	15	470000.000	3615000.000	11.9131	243.7754	2688.5690	.197292-04
35	15	475000.000	3615000.000	12.4740	242.5110	2619.9976	-.800143-05
36	15	480000.000	3615000.000	12.7221	241.1365	2586.0569	.200599-04
37	15	485000.000	3615000.000	13.1391	240.9908	2520.2339	.169964-04
38	15	490000.000	3615000.000	13.3241	224.0262	2525.3098	.460111-05
39	15	495000.000	3615000.000	12.5503	222.8160	2397.3529	-.168042-05
40	15	500000.000	3615000.000	11.9192	222.0108	2529.9891	-.548529-05
41	15	505000.000	3615000.000	11.9192	222.0108	2529.9891	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 79 (3.00568 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	16	1e0000.000	3620000.000	9.1438	221.8950	2859.8105	.000000
2	16	1e0000.000	3620000.000	9.1438	221.8950	2859.8105	.586928-05
3	16	2e0000.000	3620000.000	8.6813	220.4724	2901.0587	.679448-05
4	16	3e0000.000	3620000.000	8.0130	218.7841	3055.9366	.476762-05
5	16	3e0000.000	3620000.000	7.6486	218.7316	3125.8490	.131353-05
6	16	330000.000	3620000.000	7.5694	219.7816	3133.5764	-.237659-05
7	16	335000.000	3620000.000	7.4924	220.5852	3139.6952	-.181771-04
8	16	340000.000	3620000.000	7.4341	221.4339	3146.8271	-.191303-04
9	16	345000.000	3620000.000	7.6308	222.5765	3150.4572	-.254027-04
10	16	350000.000	3620000.000	7.0843	217.4581	3188.5203	.225277-04
11	16	355000.000	3620000.000	11.1769	229.3608	2885.3058	-.466685-04
12	16	3e0000.000	3620000.000	8.3203	241.4390	2830.5758	.576513-04
13	16	365000.000	3620000.000	4.3995	220.6500	3384.6480	.201601-03
14	16	370000.000	3620000.000	4.9392	214.3866	3276.7778	.220346-03
15	16	375000.000	3620000.000	5.5615	212.4003	3255.0017	.157241-03
16	16	3e0000.000	3620000.000	5.5995	209.9928	3284.6519	.840544-04
17	16	385000.000	3620000.000	5.4454	207.3999	3293.7141	.415560-04
18	16	390000.000	3620000.000	5.2609	204.7335	3298.7744	.263630-04
19	16	395000.000	3620000.000	5.1618	203.5624	3296.0796	.176324-04
20	16	4e0000.000	3620000.000	4.9605	202.8782	3314.1665	.125599-04
21	16	4e5000.000	3620000.000	4.7291	202.0893	3327.1826	.383570-04
22	16	410000.000	3620000.000	4.6967	198.5867	3343.3347	.401578-05
23	16	415000.000	3620000.000	3.2071	189.2108	3470.6797	.2412.0-04
24	16	4e0000.000	3620000.000	4.1716	204.3582	3359.0174	-.264173-04
25	16	4e5000.000	3620000.000	3.4577	229.0056	3403.9262	-.869408-04
26	16	430000.000	3620000.000	4.4147	233.1136	3398.7311	-.195353-04
27	16	435000.000	3620000.000	5.9146	240.3439	3322.8919	.400707-04
28	16	440000.000	3620000.000	9.2239	237.8293	3077.6139	.261040-04
29	16	445000.000	3620000.000	11.1773	241.6164	2830.7196	.502367-04
30	16	450000.000	3620000.000	11.5363	238.5094	2781.6886	.153438-04
31	16	455000.000	3620000.000	12.3106	236.6253	2691.2330	-.163890-04
32	16	4e0000.000	3620000.000	12.6086	237.2075	2627.9687	.852257-05
33	16	4e5000.000	3620000.000	12.3483	233.0268	2637.5508	-.118036-05
34	16	470000.000	3620000.000	11.9918	232.1993	2717.4291	.550256-05
35	16	475000.000	3620000.000	13.0625	234.6536	2573.3542	.244061-04
36	16	480000.000	3620000.000	13.7841	236.5962	2448.9803	.213116-04
37	16	490000.000	3620000.000	13.6833	225.6119	2422.8983	.155595-04
38	16	5100e0.000	3620000.000	13.3649	223.6308	2478.1602	-.461014-06
39	16	550000.000	3620000.000	12.3833	223.3091	2404.4378	-.134615-05
40	16	6e0000.000	3620000.000	11.8568	222.3405	2534.8304	-.248687-05
41	16	7100e0.000	3620000.000	11.8568	222.3405	2534.8304	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
4	1	1x0000.000	3340000.000	9.2781	225.4661	2874.5110	.000000
5	1	1x0000.000	3340000.000	9.2781	225.4661	2874.5110	.000000
6	1	2x0000.000	3340000.000	9.2385	225.6981	2876.0273	.000000
7	1	2x0000.000	3340000.000	9.1963	226.2236	2874.2185	.000000
8	1	3x0000.000	3340000.000	9.1954	227.0496	2864.2191	.000000
9	1	3x0000.000	3340000.000	9.2379	227.9753	2848.3952	.000000
10	1	3x0000.000	3340000.000	9.2709	228.7174	2835.8523	.000000
11	1	3x0000.000	3340000.000	9.2588	229.2684	2830.7369	.000000
12	1	3x0000.000	3340000.000	9.2763	229.6226	2833.1570	.000000
13	1	3x0000.000	3340000.000	9.0814	229.6024	2847.4533	.000000
14	1	3x0000.000	3340000.000	8.9031	229.1058	2872.0518	.000000
15	1	3x0000.000	3340000.000	8.7314	228.4823	2896.1615	.000000
16	1	3x0000.000	3340000.000	8.6209	228.2722	2906.1341	.000000
17	1	3x0000.000	3340000.000	8.5660	228.4975	2906.4457	.000000
18	1	3x0000.000	3340000.000	8.5360	228.8422	2905.7437	.000000
19	1	3x0000.000	3340000.000	8.5037	229.1861	2905.7028	.000000
20	1	3x0000.000	3340000.000	8.4939	229.5618	2904.1232	.000000
21	1	3x0000.000	3340000.000	8.4935	229.9875	2900.4490	.000000
22	1	3x0000.000	3340000.000	8.5108	230.4495	2895.1376	.000000
23	1	4x0000.000	3340000.000	8.5356	230.9236	2888.9006	.000000
24	1	4x0000.000	3340000.000	8.5664	231.3896	2882.1705	.000000
25	1	4x0000.000	3340000.000	8.5992	231.8492	2875.3844	.000000
26	-	4x0000.000	3340000.000	8.6279	232.1952	2869.8867	.000000
27	1	4x0000.000	3340000.000	8.6442	232.4147	2867.1983	.000000
28	1	4x0000.000	3340000.000	8.6493	232.4778	2866.6968	.000000
29	1	4x0000.000	3340000.000	8.6551	232.4895	2865.7043	.000000
30	1	4x0000.000	3340000.000	8.6714	232.5421	2862.9137	.000000
31	1	4x0000.000	3340000.000	8.6961	232.6356	2858.9758	.000000
32	1	4x0000.000	3340000.000	8.7228	232.7529	2854.4806	.000000
33	1	4x0000.000	3340000.000	8.7436	232.8712	2851.9506	.000000
34	1	4x0000.000	3340000.000	8.7705	233.0547	2847.3923	.000000
35	1	4x0000.000	3340000.000	8.7897	233.2515	2843.8232	.000000
36	1	4x0000.000	3340000.000	8.8061	233.4825	2840.4867	.000000
37	1	4x0000.000	3340000.000	8.8106	233.6902	2838.9944	.000000
38	1	4x0000.000	3340000.000	8.7977	233.8534	2839.9543	.000000
39	1	4x0000.000	3340000.000	8.7771	233.9842	2841.6099	.000000
40	1	4x0000.000	3340000.000	8.7516	233.7375	2843.6873	.000000
41	1	4x0000.000	3340000.000	8.8057	232.7283	2844.7526	.000000
42	-	4x0000.000	3340000.000	8.8224	231.2655	2841.5916	.000000
43	1	4x0000.000	3340000.000	8.8707	230.2579	2837.3872	.000000
44	1	4x0000.000	3340000.000	8.8707	230.2579	2837.3872	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.09499 HOURS) **

I INDEX	J INDEX	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	2	100000.000	3420000.000	9.2741	225.4661	2874.5110	.000000
2	2	150000.000	3420000.000	9.2741	225.4661	2874.5110	.257611-07
3	2	200000.000	3420000.000	9.2385	225.6981	2876.0273	-.628045-06
4	2	250000.000	3420000.000	9.1963	226.2236	2874.2185	-.213740-05
5	2	300000.000	3420000.000	9.1934	227.0496	2864.2191	-.441411-05
6	2	350000.000	3420000.000	9.2379	227.9753	2848.3952	-.744703-05
7	2	400000.000	3420000.000	9.2709	228.7178	2835.8523	-.119025-04
8	2	450000.000	3420000.000	9.2965	229.2684	2830.7369	-.132478-04
9	2	500000.000	3420000.000	9.2920	229.6226	2833.1570	-.139601-04
10	2	550000.000	3420000.000	9.0914	229.5024	2847.4533	-.131711-04
11	2	600000.000	3420000.000	8.7931	229.1058	2872.8518	-.107027-04
12	2	650000.000	3420000.000	8.7314	228.4823	2898.1615	-.8[illegible]8130-05
13	2	700000.000	3420000.000	8.6209	228.2722	2906.1341	-.9[illegible]5793-05
14	2	750000.000	3420000.000	8.5630	228.4975	2906.[illegible]457	-.[illegible]84493-05
15	2	800000.000	3420000.000	8.5560	228.8422	2905.7637	-.964904-05
16	2	850000.000	3420000.000	8.5767	229.1861	2905.7028	-.895913-05
17	2	900000.000	3420000.000	8.6039	229.5618	2904.1232	-.806878-05
18	2	950000.000	3420000.000	8.6355	229.9879	2900.4890	-.719335-05
19	2	1000000.000	3420000.000	8.5108	230.4495	2895.1376	-.641885-05
20	2	1050000.000	3420000.000	8.5757	230.9236	2888.9098	-.576217-05
21	2	1100000.000	3420000.000	8.5604	231.3896	2882.1785	-.518455-05
22	2	1150000.000	3420000.000	8.5992	231.8292	2875.3849	-.467250-05
23	2	1200000.000	3420000.000	8.6278	232.1952	2869.6067	-.421871-05
24	2	1250000.000	3420000.000	8.6942	232.4147	2867.1883	-.195739-05
25	2	1300000.000	3420000.000	8.6493	232.4776	2866.6948	-.630927-06
26	2	1350000.000	3420000.000	8.6551	232.4895	2865.[illegible]643	.515801-06
27	2	1400000.000	3420000.000	8.6714	232.5421	2862.9157	.772354-06
28	2	1450000.000	3420000.000	8.6901	232.6356	2858.9758	.555846-06
29	2	1500000.000	3420000.000	8.7225	232.7522	2854.9606	-.559870-07
30	2	1550000.000	3420000.000	8.7460	232.8912	2851.0366	-.102080-05
31	2	1600000.000	3420000.000	8.7705	233.0547	2847.3925	-.229481-05
32	2	1650000.000	3420000.000	8.7837	233.2515	2843.8202	-.367771-05
33	2	1700000.000	3420000.000	8.8043	233.4825	2840.4807	-.481092-05
34	2	1750000.000	3420000.000	8.8100	233.6902	2838.9984	-.622656-05
35	2	1800000.000	3420000.000	8.7976	233.8534	2839.9593	-.715983-05
36	2	1850000.000	3420000.000	8.7774	233.9842	2841.6099	.887113-06
37	2	1900000.000	3420000.000	8.8318	234.[illegible]	2843.8673	.854133-05
38	2	1950000.000	3420000.000	9.0057	234.7233	2844.7886	.807544-05
39	2	2000000.000	3420000.000	9.2241	234.2855	2841.5916	.370574-05
40	2	2050000.000	3420000.000	9.3707	233.2570	2837.3872	.838258-06
41	2	2100000.000	3420000.000	9.3707	233.2570	2837.3872	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	3	1e0060.000	3500000.000	9.1646	225.6649	2889.6422	.000000
2	3	1e0C90.000	3500000.000	9.1646	225.6649	2889.6422	.755634-06
3	3	2e0080.000	3500000.000	9.0818	225.8768	2896.1004	.176435-06
4	3	3J0000.000	3500000.000	8.9587	226.3591	2903.6470	-.142950-05
5	3	3e0000.000	3500000.000	8.8568	227.0926	2905.9774	-.411216-05
6	3	3e0000.000	3500000.000	8.8003	227.9135	2902.3677	-.889650-05
7	3	3J5000.000	3500000.000	8.7653	228.7073	2896.0970	-.154711-04
8	3	3e0040.000	3500000.000	8.7258	229.6373	2887.4025	-.168174-04
9	3	3e5060.000	3500000.000	8.7176	230.7599	2869.1575	-.152123-04
10	3	3e0000.000	3500000.000	8.7623	231.9538	2828.6881	-.990857-05
11	3	3J5000.000	3500000.000	8.7062	232.1594	2808.7255	-.349330-05
12	3	3e0000.000	3500000.000	8.4422	230.2894	2867.1515	-.614740-05
13	3	3e5000.000	3500000.000	8.1377	228.9663	2940.9430	-.940681-05
14	3	37 000.000	3500000.000	8.0257	229.1343	2962.4123	-.112407-04
15	3	375000.000	3500000.000	8.0010	229.7918	2960.4732	-.101584-04
16	3	3e00e0.000	3500000.000	7.9712	230.3477	2960.8595	-.860367-05
17	3	3e5000.000	3500000.000	7.9528	230.8838	2960.7581	-.694402-05
18	3	390000.000	3500000.000	7.9506	231.4345	2958.4631	-.550730-05
19	3	395000.000	3500000.000	7.9687	232.0441	2952.1288	-.438440-05
20	3	400000.000	3500000.000	8.0055	232.7188	2941.2222	-.355899-05
21	3	405000.000	3500000.000	8.0533	233.3785	2928.4532	-.338956-05
22	3	410000.000	3500000.000	8.1068	234.0618	2915.2185	-.259981-05
23	3	415000.000	3500000.000	8.1928	234.7883	2894.9011	-.120865-05
24	3	420000.000	3500000.000	8.2923	235.5013	2868.2817	.134078-05
25	3	425000.000	3500000.000	8.3494	235.6381	2856.2226	.214234-05
26	3	430000.000	3500000.000	8.3457	235.4636	2861.7697	.213272-05
27	3	435000.000	3500000.000	8.3531	235.4144	2865.9750	.164031-05
28	3	440000.000	3500000.000	8.3885	235.5051	2864.4555	.101784-05
29	3	445000.000	3500000.000	8.4295	235.6453	2862.1503	.250899-06
30	3	450000.000	3500000.000	8.4764	235.8242	2858.8545	-.762590-06
31	3	455000.000	3500000.000	8.5252	236.0519	2854.0113	-.201964-05
32	3	460000.000	3500000.000	8.5625	236.2343	2853.0180	-.369071-05
33	3	465000.000	3500000.000	8.6087	236.5047	2850.7670	-.483696-05
34	3	470000.000	3500000.000	8.6887	237.0045	2836.6967	-.474486-05
35	3	475000.000	3500000.000	8.7455	237.2097	2827.7728	-.307172-05
36	3	480000.000	3500000.000	8.7460	236.9301	2838.7945	.527713-05
37	3	490000.000	3500000.000	8.8136	236.1015	2852.8901	.114696-04
38	3	510000.000	3500000.000	9.0236	234.5275	2853.7531	.923428-05
39	3	550000.000	3500000.000	9.2827	232.0672	2843.7216	.334240-05
40	3	630000.000	3500000.000	9.4466	230.5320	2833.5071	-.636680-07
41	3	710000.000	3500000.000	9.4466	230.5320	2833.5071	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	4	100000.000	3540000.000	8.9953	225.9169	2911.7972	.000000
2	4	180000.000	3540000.000	8.9953	225.9169	2911.7972	.236327-05
3	4	260000.000	3540000.000	8.8423	226.0809	2926.2155	.216467-05
4	4	300000.000	3540000.000	8.5890	226.4572	2960.7509	.977378-06
5	4	320000.000	3540000.000	8.3263	226.9713	2989.7880	-.149934-05
6	4	330000.000	3540000.000	8.0998	227.4336	3012.7181	-.709795-05
7	4	335000.000	3540000.000	7.8992	227.8353	3027.2667	-.153787-04
8	4	340000.000	3540000.000	7.7180	228.6798	3052.6065	-.139996-04
9	4	345000.000	3540000.000	7.6044	229.8574	3058.9511	-.661050-05
10	4	350000.000	3540000.000	7.6721	231.7234	3070.6111	.279483-05
11	4	355000.000	3540000.000	8.5279	236.7607	3158.2848	.626090-05
12	4	360000.000	3540000.000	8.7687	236.2746	2901.7893	-.684257-05
13	4	365000.000	3540000.000	7.5496	230.8057	3046.3484	-.130563-04
14	4	370000.000	3540000.000	7.2850	230.7172	3092.4412	-.138095-04
15	4	375000.000	3540000.000	7.2283	231.6846	3090.5551	-.936497-05
16	4	380000.000	3540000.000	7.1852	232.4736	3094.2642	-.478361-05
17	4	385000.000	3540000.000	7.1664	233.1757	3098.3764	-.183114-05
18	4	390000.000	3540000.000	7.1578	233.7634	3100.1190	.172040-05
19	4	395000.000	3540000.000	7.1473	234.2468	3099.9271	.351776-05
20	4	400000.000	3540000.000	7.1859	235.0053	3110.2535	.455719-05
21	4	405000.000	3540000.000	7.2597	235.8281	3100.2932	.484327-05
22	4	410000.000	3540000.000	7.3173	236.6472	3108.2560	.507831-05
23	4	415000.000	3540000.000	7.3955	237.3414	3080.1576	.605499-06
24	4	420000.000	3540000.000	7.6489	238.9417	3119.9255	.831518-05
25	4	425000.000	3540000.000	8.0771	240.3578	3054.6393	.598305-05
26	4	430000.000	3540000.000	8.0420	239.8947	3041.6612	.374152-05
27	4	435000.000	3540000.000	8.0125	239.6908	3046.5854	.166992-05
28	4	440000.000	3540000.000	8.0649	239.8544	3035.8311	.171978-06
29	4	445000.000	3540000.000	8.1263	240.0827	3027.0657	-.752740-06
30	4	450000.000	3540000.000	8.1920	240.2942	3010.2573	-.191752-05
31	4	455000.000	3540000.000	8.2946	240.6582	3008.3702	-.355461-05
32	4	460000.000	3540000.000	8.4079	241.0685	2988.6011	-.541827-05
33	4	465000.000	3540000.000	8.3858	240.9207	2957.6583	-.596248-05
34	4	470000.000	3540000.000	8.5251	241.5322	2985.2794	-.331347-05
35	4	475000.000	3540000.000	8.9691	242.5737	2938.3340	.843447-06
36	4	480000.000	3540000.000	8.9827	241.5810	2886.6598	.844091-05
37	4	490000.000	3540000.000	8.9413	239.4949	2915.2321	.130411-04
38	4	510000.000	3540000.000	9.1607	236.4572	2895.8206	.891951-05
39	4	550000.000	3540000.000	9.4594	232.8491	2834.3116	.140983-05
40	4	630000.000	3540000.000	9.6392	230.4888	2813.7545	-.230402-05
41	4	710000.000	3540000.000	9.6392	230.4888	2813.7545	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
4	3	100000.000	350000.000	8.8610	225.9304	2927.2531	.000000
4	4	150000.000	350000.000	8.8610	225.9304	2927.2531	.464664-05
4	5	200000.000	350000.000	8.6404	226.0333	2949.5015	.516816-05
4	6	250000.000	350000.000	8.2681	226.2516	3004.5245	.506070-05
5	6	300000.000	350000.000	7.8646	226.4659	3055.6651	.381462-05
6	6	350000.000	350000.000	7.5033	226.4740	3100.5095	-.138046-05
7	6	400000.000	350000.000	7.1885	226.4429	3131.3890	-.110003-04
8	6	450000.000	350000.000	6.9403	227.1111	3173.0022	-.510647-05
9	6	500000.000	350000.000	6.8325	228.1330	3175.3459	.918808-05
10	6	550000.000	350000.000	6.9720	230.3015	3163.2728	.178257-04
11	6	600000.000	350000.000	6.4174	230.7363	3265.5215	.809247-05
12	6	650000.000	350000.000	8.7915	239.1052	2878.9442	-.645237-05
13	6	700000.000	350000.000	6.8773	231.5486	3119.1050	-.986587-05
14	6	750000.000	350000.000	6.5670	231.8046	3191.0448	-.687942-05
15	6	800000.000	350000.000	6.5545	233.3340	3164.2477	.160714-06
16	6	850000.000	350000.000	6.5364	234.2850	3187.4221	.662880-05
17	6	900000.000	350000.000	6.5467	235.0083	3192.3603	.113104-04
18	6	950000.000	350000.000	6.5526	235.4739	3195.0084	.146204-04
19	6	1000000.000	350000.000	6.5503	235.7148	3194.6461	.165878-04
20	6	1050000.000	350000.000	6.6138	236.3184	3208.9609	.169968-04
21	6	1100000.000	350000.000	6.7132	237.0320	3194.2170	.151101-04
22	6	1150000.000	350000.000	6.7811	237.8015	3208.1393	.145438-04
23	6	1200000.000	350000.000	6.8830	238.5075	3164.2646	.145306-04
24	6	1250000.000	350000.000	7.2916	240.7008	3216.1214	.134347-04
25	6	1300000.000	350000.000	7.9303	242.6928	3115.7861	.714893-05
26	6	1350000.000	350000.000	7.3339	242.4269	3104.0804	.348138-05
27	6	1400000.000	350000.000	7.7435	242.3199	3119.6126	.140695-05
28	6	1450000.000	350000.000	7.8302	242.7107	3109.0936	.407500-06
29	6	1500000.000	350000.000	7.9134	243.1200	3100.0202	-.108432-06
30	6	1550000.000	350000.000	8.0096	243.4903	3077.1349	-.181486-05
31	6	1600000.000	350000.000	8.1534	244.0763	3074.4827	-.602502-05
32	6	1650000.000	350000.000	8.3932	244.7919	3048.3305	-.979498-05
33	6	1700000.000	350000.000	8.3100	244.8301	3005.2936	-.670916-05
34	6	1750000.000	350000.000	8.6214	245.0948	3037.6772	-.385069-06
35	6	1800000.000	350000.000	9.3724	246.1146	2956.1004	.176231-05
36	6	1850000.000	350000.000	9.3521	244.6681	2884.8651	.694131-05
37	6	1900000.000	350000.000	9.2130	241.7189	2929.9815	.114409-04
38	6	1950000.000	350000.000	9.4404	237.5248	2897.1408	.583000-05
39	6	2000000.000	350000.000	9.7409	232.7140	2800.7069	-.243852-05
40	6	2050000.000	350000.000	9.9649	229.5969	2768.9140	-.574265-05
41	6	2100000.000	350000.000	9.9649	229.5969	2768.9140	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (FEET)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	2	1x0000.000	3570000.000	6.8175	225.5213	2927.3209	.000000
2	2	1x0000.000	3570000.000	6.8175	225.5213	2927.3209	.784813-05
3	2	2x6000.000	3570000.000	6.5483	225.5570	2955.3613	.950835-05
4	2	3x0000.000	3570000.000	6.0939	225.6037	3024.0564	.111902-04
5	2	3x0000.000	3570000.000	7.6023	225.4988	3089.1684	.122131-04
6	2	3x0000.000	3570000.000	7.1724	225.0918	3144.7810	.103464-04
7	2	3350x0.000	3570000.000	6.9955	224.9581	3164.3422	.195283-05
8	2	3x0000.000	3570000.000	6.5955	226.3130	3194.7994	.788539-05
9	2	3x50x0.000	3570000.000	6.5684	225.8779	3194.1022	.181396-04
10	2	3500x0.000	3570000.000	6.6620	227.5188	3174.[illegible]98	.339640-04
11	2	3x50x0.000	3570000.000	6.1839	230.3186	3311.[illegible]2	.119208-04
12	2	3x0000.000	3570000.000	6.3393	229.8522	2876.3078	.941954-05
13	2	3x50x0.000	3570000.000	6.2864	231.1320	3168.5248	.134984-04
14	2	3700x0.000	3570000.000	6.0442	231.9127	3234.2823	.198729-04
15	2	3750x0.000	3570000.000	6.1273	233.5934	3219.0694	.251048-04
16	2	3x0000.000	3570000.000	6.1959	234.5293	3222.5791	.295541-04
17	2	3x50x0.000	3570000.000	6.2864	235.1284	3226.9636	.313707-04
18	2	3900x0.000	3570000.000	6.2533	235.4174	3228.7617	.320955-04
19	2	3950x0.000	3570000.000	6.2774	235.4143	3228.9566	.319227-04
20	2	4x000.000	3570000.000	6.3962	235.6364	3247.0484	.300173-04
21	2	4x50x0.000	3570000.000	6.4849	236.1550	3234.0090	.277166-04
22	2	4x00x0.000	3570000.000	6.5739	236.6386	3248.0074	.241211-04
23	2	4150x0.000	3570000.000	6.6600	238.1180	3194.1775	.241419-04
24	2	4200x0.000	3570000.000	7.1511	240.1612	3252.3463	.160680-04
25	2	4250x0.000	3570000.000	7.3043	243.4143	3143.7299	.131861-04
26	2	4300000.000	3570000.000	7.6448	243.3286	3132.0805	.840899-05
27	2	4350x0.000	3570000.000	7.5519	243.6402	3150.1895	.765224-05
28	2	44x0x0.000	3570000.000	7.6360	244.2097	3140.0312	.521653-05
29	2	4450x0.000	3570000.000	7.7519	244.5870	3136.0227	.242516-05
30	2	4500x0.000	3570000.000	7.9595	245.0670	3120.3044	.104483-06
31	2	4550x0.000	3570000.000	8.0323	245.7706	3125.9193	-.521570-05
32	2	4600x0.000	3570000.000	8.3011	247.1266	3090.4417	-.803048-05
33	2	4650x0.000	3570000.000	8.4075	247.6226	3016.5919	-.161019-05
34	2	47000x.000	3570000.000	8.9269	248.7418	3033.3802	-.585194-05
35	2	4750x0.000	3570000.000	9.3912	249.9764	2947.1022	-.982052-05
36	2	48x0x0.000	3570000.000	9.6657	248.0336	2877.3489	.357208-05
37	2	4850x0.000	3570000.000	9.4995	242.5663	2923.9818	.727621-05
38	2	49x0x0.000	3570000.000	9.7775	237.4456	2874.4540	-.869052-06
39	2	4950x0.000	3570000.000	10.1345	231.7555	2751.6451	-.874482-05
40	2	5x00x0.000	3570000.000	10.3543	228.1509	2710.3424	-.105817-04
41	2	5x00x0.000	3570000.000	10.3543	228.1309	2710.3424	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

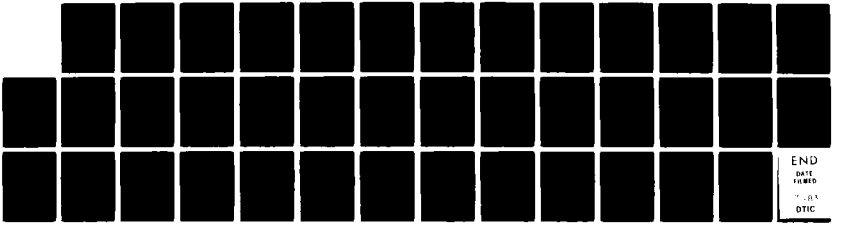
X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	7	1e0000.000	3575000.000	8.8315	224.8717	2917.9299	.000000
2	7	1e0000.000	3575000.000	8.8315	224.8717	2917.9299	.113026-04
3	7	2e0000.000	3575000.000	8.5274	224.8297	2950.0573	.140481-04
4	7	3e0000.000	3575000.000	8.0124	224.7490	3025.2989	.166976-04
5	7	4e0000.000	3575000.000	7.4669	224.3406	3098.2922	.179750-04
6	7	5e0000.000	3575000.000	7.0328	223.3637	3153.0619	.148586-04
7	7	6e0000.000	3575000.000	6.6179	221.8845	3174.3890	.793322-05
8	7	6e0000.000	3575000.000	6.6162	223.1129	3306.0009	.116224-04
9	7	6e5000.000	3575000.000	6.7383	224.5993	3199.6614	.334887-04
10	7	6e0000.000	3575000.000	6.5341	222.8393	3171.5656	.278940-04
11	7	6e0000.000	3575000.000	7.7493	237.4642	3332.4193	.198018-04
12	7	6e0000.000	3575000.000	7.8027	240.8250	2874.7438	.480887-04
13	7	6e5000.000	3575000.000	5.8566	230.1104	3149.6356	.671082-04
14	7	6e0000.000	3575000.000	5.6053	231.7276	3244.5797	.670966-04
15	7	6e0000.000	3575000.000	5.8713	232.3167	3214.6683	.579508-04
16	7	6e0000.000	3575000.000	5.9086	233.4658	3227.7084	.655107-04
17	7	6e5000.000	3575000.000	5.9926	234.1150	3229.1538	.617405-04
18	7	6e0000.000	3575000.000	6.0733	234.4182	3230.4210	.556085-04
19	7	6e5000.000	3575000.000	6.1440	234.6490	3228.5334	.509953-04
20	7	7e0000.000	3575000.000	6.2968	234.5212	3232.2811	.464454-04
21	7	7e5000.000	3575000.000	6.3578	235.0072	3218.2271	.454287-04
22	7	8e0000.000	3575000.000	6.3681	235.2936	3224.7308	.367076-04
23	7	8e5000.000	3575000.000	6.4755	237.3191	3215.7402	.345189-04
24	7	9e0000.000	3575000.000	7.0601	239.4563	3223.7206	.249251-04
25	7	9e5000.000	3575000.000	7.4695	243.2746	3158.7590	.285086-04
26	7	1e6000.000	3575000.000	7.3641	243.6182	3149.2967	.224498-04
27	7	1e5000.000	3575000.000	7.2935	244.5461	3178.5240	.221208-04
28	7	1e0000.000	3575000.000	7.5002	245.7960	3159.8025	.171177-04
29	7	1e5000.000	3575000.000	7.6536	246.5074	3129.4131	.970469-05
30	7	1e0000.000	3575000.000	7.7980	246.7721	3112.0125	.340807-05
31	7	1e5000.000	3575000.000	7.8843	247.4366	3090.8736	.591851-05
32	7	1e0000.000	3575000.000	8.0803	246.4615	3065.2731	.940689-06
33	7	1e5000.000	3575000.000	8.4895	245.9968	3044.0759	.562816-05
34	7	1e0000.000	3575000.000	9.5092	247.3089	2974.4647	-.238890-04
35	7	1e5000.000	3575000.000	10.1738	247.5925	2861.0841	-.613161-05
36	7	1e0000.000	3575000.000	9.7139	247.0543	2860.8517	.956735-05
37	7	1e0000.000	3575000.000	9.7237	243.1013	2890.0200	.887670-05
38	7	1e0000.000	3575000.000	10.3594	237.2092	2833.6382	-.753043-0
39	7	1e0000.000	3575000.000	10.4695	230.7559	2704.6113	-.109942-04
40	7	1e0000.000	3575000.000	10.5866	226.9222	2661.6293	-.153127-04
41	7	1e0000.000	3575000.000	10.5866	226.9222	2661.6293	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

I INDEX	J INDEX	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	1	100000.000	3500000.000	8.4431	224.2005	2968.7427	.000000
2	2	150000.000	3500000.000	8.8431	224.2005	2908.7427	.124411-04
3	3	200000.000	3500000.000	8.5137	224.0079	2943.3083	.148424-04
4	3	250000.000	3500000.000	7.9277	223.9127	3027.9774	.153046-04
5	3	300000.000	3500000.000	7.3566	223.3501	3108.3573	.120585-04
6	3	350000.000	3500000.000	6.9669	221.9180	3155.1596	.272652-05
7	3	400000.000	3500000.000	6.7734	221.6508	3196.7939	.158959-04
8	3	450000.000	3500000.000	7.0535	219.8965	3200.5949	.978570-05
9	3	500000.000	3500000.000	6.7634	219.9347	3197.3967	-.221763-05
10	3	550000.000	3500000.000	6.5112	218.0687	3166.4165	-.574640-04
11	3	600000.000	3500000.000	7.8702	227.1976	3454.2321	-.887529-04
12	3	650000.000	3500000.000	7.2103	240.9384	2953.6226	.440962-04
13	3	700000.000	3500000.000	5.1792	228.7128	3145.0794	.906044-04
14	3	750000.000	3500000.000	5.2408	229.3334	3294.9679	.897567-04
15	3	800000.000	3500000.000	5.5706	231.9297	3202.4586	.884304-04
16	3	850000.000	3500000.000	5.4607	231.6396	3228.2027	.884788-04
17	3	900000.000	3500000.000	5.6482	232.8652	3232.5775	.896187-04
18	3	950000.000	3500000.000	5.7924	233.2722	3232.2149	.773345-04
19	3	1000000.000	3500000.000	5.8694	234.5100	3232.9649	.686314-04
20	4	50000.000	3500000.000	8.0498	233.9852	3226.1212	.593732-04
21	4	100000.000	3500000.000	6.0547	234.0745	3234.7362	.541023-04
22	4	150000.000	3500000.000	6.1987	234.6516	3250.1297	.488343-04
23	4	200000.000	3500000.000	6.3199	236.5344	3233.6644	.393960-04
24	4	250000.000	3500000.000	6.7071	240.1571	3236.0035	.297792-04
25	4	300000.000	3500000.000	7.1394	242.8957	3197.9034	.231031-04
26	4	350000.000	3500000.000	7.4645	244.6133	3179.2109	.278346-04
27	4	400000.000	3500000.000	7.1055	245.4305	3196.3629	.268351-04
28	4	450000.000	3500000.000	7.1993	245.9478	3180.4346	.232034-04
29	4	500000.000	3500000.000	7.4031	246.5132	3170.9293	.155367-04
30	4	550000.000	3500000.000	7.5722	246.7487	3156.4029	.126895-04
31	4	600000.000	3500000.000	7.6624	246.6673	3113.3035	.597646-05
32	4	650000.000	3500000.000	7.3443	245.1812	3076.7714	.185931-04
33	4	700000.000	3500000.000	8.0534	241.0021	3075.2495	.174479-05
34	4	750000.000	3500000.000	10.1009	240.1545	2892.0135	-.256282-05
35	4	800000.000	3500000.000	9.9335	240.0858	2896.8457	.810169-05
36	4	850000.000	3500000.000	9.9737	239.2016	2905.2404	.189592-04
37	4	900000.000	3500000.000	10.0950	238.8678	2898.0877	.964149-05
38	4	950000.000	3500000.000	10.3945	238.7770	2829.8044	-.484672-05
39	4	1000000.000	3500000.000	10.7948	238.0168	2658.4975	-.148002-04
40	4	1050000.000	3500000.000	10.9592	238.1702	2625.7036	-.162537-04
41	4	1100000.000	3500000.000	10.9592	238.1702	2625.7036	.000000

AD-A129 066 STUDY AND INVESTIGATION OF COMPUTER ALGORITHMS FOR THE SOLUTION OF THE SH..(U) CRAMER (H E) CO INC SALT LAKE CITY UT A G TINGLE ET AL. JUL 73 TR-73-302-01-APP 2/2

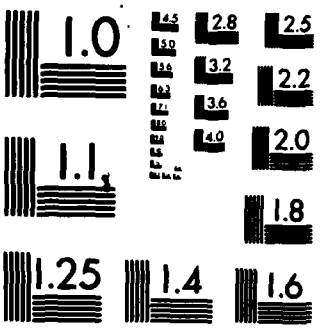
UNCLASSIFIED DAAD07-72-C-0309 F/G 4/2 NL



END

DATE FILMED

DTIC



** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	1	1300000.000	3585000.000	6.8477	223.5225	2900.5620	.000000
2	1	1350000.000	3585000.000	6.8477	223.5225	2900.5620	.135286-04
3	1	1400000.000	3585000.000	6.5142	223.0404	2931.4376	.151655-04
4	1	1450000.000	3585000.000	7.8529	223.0307	3030.2775	.127282-04
5	1	1500000.000	3585000.000	7.2836	222.5246	3113.0088	.479255-05
6	1	1550000.000	3585000.000	6.9603	221.4782	3152.9750	-.714894-06
7	1	1600000.000	3585000.000	6.9000	220.4832	3196.1368	.605597-05
8	1	1650000.000	3585000.000	6.9805	220.0496	3196.6444	.134211-04
9	1	1700000.000	3585000.000	6.9824	219.7848	3174.5742	-.190253-04
10	1	1750000.000	3585000.000	7.4024	220.4421	3192.1053	-.885199-04
11	1	1800000.000	3585000.000	7.9540	220.9950	2952.4480	-.154050-03
12	1	1850000.000	3585000.000	5.5320	233.3387	3007.5067	-.770850-04
13	1	1900000.000	3585000.000	4.7829	228.2864	3176.7322	.213553-04
14	1	1950000.000	3585000.000	4.9440	225.4050	3242.4062	.537173-04
15	1	2000000.000	3585000.000	4.3365	229.2081	3215.8638	.760602-04
16	1	2050000.000	3585000.000	4.9957	229.9043	3234.7890	.926883-04
17	1	2100000.000	3585000.000	5.1741	231.1232	3240.5549	.107924-03
18	1	2150000.000	3585000.000	5.3401	231.1540	3227.4188	.991269-04
19	1	2200000.000	3585000.000	5.4355	230.4823	3267.7318	.900654-04
20	1	2250000.000	3585000.000	5.8529	233.0758	3229.3117	.705345-04
21	1	2300000.000	3585000.000	5.7862	232.9765	3245.2727	.664096-04
22	1	2350000.000	3585000.000	5.8219	233.4692	3253.8127	.579108-04
23	1	2400000.000	3585000.000	5.9601	234.9053	3234.1909	.488130-04
24	1	2450000.000	3585000.000	6.3598	240.7792	3263.1907	.389805-04
25	1	2500000.000	3585000.000	6.3640	243.2872	3182.4063	.226458-04
26	1	2550000.000	3585000.000	6.5683	245.7827	3187.7074	.308522-04
27	1	2600000.000	3585000.000	6.6157	247.4000	3196.1189	.303304-04
28	1	2650000.000	3585000.000	6.8758	248.7509	3187.2439	.294479-04
29	1	2700000.000	3585000.000	7.0703	250.2183	3178.0551	.217914-04
30	1	2750000.000	3585000.000	7.2091	251.2322	3155.0753	.133332-04
31	1	2800000.000	3585000.000	7.5214	252.5643	3094.0730	.200822-04
32	1	2850000.000	3585000.000	8.4478	256.1869	3117.7708	.150479-04
33	1	2900000.000	3585000.000	9.2657	260.8815	2940.8999	.368637-05
34	1	2950000.000	3585000.000	9.0213	260.3022	2886.5141	.188387-04
35	1	3000000.000	3585000.000	9.0877	260.7319	2907.3745	.206370-04
36	1	3050000.000	3585000.000	10.3574	262.4825	2850.1647	.227122-04
37	1	3100000.000	3585000.000	10.4971	261.1666	2847.2131	.112627-04
38	1	3150000.000	3585000.000	10.7757	259.6396	2792.6614	-.441490-05
39	1	3200000.000	3585000.000	11.0001	229.3532	2612.1879	-.158799-04
40	1	3250000.000	3585000.000	11.2313	225.5004	2590.5179	-.176246-04
41	1	3300000.000	3585000.000	11.2313	225.5004	2590.5179	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	10	100000.000	3590000.000	8.9469	222.8606	2893.6743	.000000
2	10	120000.000	3590000.000	8.9469	222.8606	2893.6743	.140935-04
3	10	260000.000	3590000.000	8.5381	221.9455	2910.4836	.146517-04
4	10	300000.000	3590000.000	7.8687	221.6426	3042.7995	.105430-04
5	10	320000.000	3590000.000	7.3471	221.0709	3127.3105	.159913-05
6	10	330000.000	3590000.000	7.0341	220.7044	3177.5793	-.902154-06
7	10	335000.000	3590000.000	7.0693	219.6082	3200.2530	.438950-05
8	10	340000.000	3590000.000	6.9827	220.1336	3192.9721	.894904-05
9	10	345000.000	3590000.000	6.8551	221.2581	3191.3888	.913499-05
10	10	350000.000	3590000.000	7.1711	223.7564	3179.9778	-.618061-04
11	10	355000.000	3590000.000	6.3271	237.5198	3177.9197	-.114513-03
12	10	360000.000	3590000.000	5.8693	235.4833	3136.3818	-.147624-03
13	10	365000.000	3590000.000	5.1013	223.9358	3185.5876	-.689100-04
14	10	370000.000	3590000.000	4.6510	226.2687	3227.2909	-.176787-04
15	10	375000.000	3590000.000	4.5736	227.5266	3235.4772	.269891-04
16	10	380000.000	3590000.000	4.6135	228.2390	3234.7945	.663211-04
17	10	385000.000	3590000.000	4.7220	228.9180	3243.0977	.933208-04
18	10	390000.000	3590000.000	4.3903	227.7537	3223.8115	.100589-03
19	10	395000.000	3590000.000	5.1865	231.1844	3346.0849	.996176-04
20	10	400000.000	3590000.000	5.6686	232.8050	3217.1274	.896315-04
21	10	405000.000	3590000.000	5.3779	231.1221	3255.7454	.761261-04
22	10	410000.000	3590000.000	5.4663	232.6821	3261.6660	.641660-04
23	10	415000.000	3590000.000	5.4852	233.7729	3244.9880	.573398-04
24	10	420000.000	3590000.000	6.0062	237.8710	3335.4864	.411356-04
25	10	425000.000	3590000.000	6.2883	245.3776	3206.3260	.389794-04
26	10	430000.000	3590000.000	6.0217	246.7244	3232.4995	.217355-04
27	10	435000.000	3590000.000	6.2614	249.5011	3255.0885	.297519-04
28	10	440000.000	3590000.000	6.6846	247.6177	3226.5170	.236771-04
29	10	445000.000	3590000.000	6.8649	251.8935	3213.4120	.457292-04
30	10	450000.000	3590000.000	7.0835	253.5612	3119.9646	.260310-04
31	10	455000.000	3590000.000	7.9996	251.4825	3165.0848	.166564-04
32	10	460000.000	3590000.000	9.7518	247.8058	3001.0306	.779384-05
33	10	465000.000	3590000.000	10.0460	246.6261	2841.3779	.213661-04
34	10	470000.000	3590000.000	9.6799	246.7998	2922.5004	.140778-04
35	10	475000.000	3590000.000	10.3336	248.0364	2925.1765	.326975-04
36	10	480000.000	3590000.000	10.8858	244.6841	2762.0156	.247630-04
37	10	490000.000	3590000.000	10.9110	240.5972	2806.7899	.146862-04
38	10	510000.000	3590000.000	11.0623	235.2664	2765.3088	-.296376-05
39	10	550000.000	3590000.000	11.3840	228.8435	2571.2782	-.169675-04
40	10	600000.000	3590000.000	11.5316	224.7802	2551.1939	-.190132-04
41	10	710000.000	3590000.000	11.5316	224.7802	2551.1939	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	11	100000.000	3595000.000	8.8760	222.2633	2888.4480	.000000
2	11	160000.000	3595000.000	8.9380	222.2603	2888.4480	.142499-04
3	11	220000.000	3595000.000	8.5463	221.0645	2893.3056	.140246-04
4	11	280000.000	3595000.000	8.0431	219.5186	3055.7259	.108455-04
5	11	340000.000	3595000.000	7.6062	218.3864	3143.2050	.657019-05
6	11	400000.000	3595000.000	7.2265	218.5302	3212.2643	.524596-05
7	11	460000.000	3595000.000	7.1067	218.7425	3179.5739	.151038-05
8	11	520000.000	3595000.000	6.7019	218.6267	3208.5316	.343834-05
9	11	580000.000	3595000.000	6.5947	220.1247	3227.2509	.187890-04
10	11	640000.000	3595000.000	6.3730	219.4041	3201.3625	-.363822-06
11	11	700000.000	3595000.000	6.6682	229.9991	3474.5125	-.746700-04
12	11	760000.000	3595000.000	7.0724	236.0573	3127.1510	-.119085-03
13	11	820000.000	3595000.000	5.6062	227.7344	3146.0074	-.105311-03
14	11	880000.000	3595000.000	4.9025	224.4412	3221.3878	-.673489-04
15	11	940000.000	3595000.000	4.5538	225.5250	3237.7964	-.261999-04
16	11	1000000.00	3595000.000	4.3847	226.3949	3238.8329	.205429-04
17	11	1060000.00	3595000.000	4.4329	227.1404	3246.3331	.542639-04
18	11	1120000.00	3595000.000	4.4969	227.2909	3223.0874	.818044-04
19	11	1180000.00	3595000.000	4.9821	226.7282	3294.3545	.877564-04
20	11	1240000.00	3595000.000	5.0063	231.2715	3229.9060	.989938-04
21	11	1300000.00	3595000.000	4.9116	229.7172	3261.8084	.871726-04
22	11	1360000.00	3595000.000	5.0137	231.1364	3279.0898	.709679-04
23	11	1420000.00	3595000.000	5.1494	234.4973	3265.7933	.697588-04
24	11	1480000.00	3595000.000	5.4236	236.3978	3246.0164	.580409-04
25	11	1540000.00	3595000.000	5.3921	245.9788	3262.6577	.517401-04
26	11	1600000.00	3595000.000	5.7727	249.0874	3225.1123	.256338-04
27	11	1660000.00	3595000.000	6.3376	250.5555	3253.9728	.159541-04
28	11	1720000.00	3595000.000	6.4555	251.1840	3064.9453	.215120-04
29	11	1780000.00	3595000.000	6.0942	248.3594	3215.2134	.223200-04
30	11	1840000.00	3595000.000	7.4026	251.6418	3241.2372	.431941-04
31	11	1900000.00	3595000.000	9.2145	250.5464	3019.1270	.222318-04
32	11	1960000.00	3595000.000	10.0901	247.8698	2851.2150	.318397-05
33	11	2020000.00	3595000.000	9.9351	246.0742	2854.1995	.153927-04
34	11	2080000.00	3595000.000	9.9141	244.8632	2921.5677	.114306-04
35	11	2140000.00	3595000.000	10.7861	245.5907	2914.2671	.147198-04
36	11	2200000.00	3595000.000	11.1742	245.1111	2705.7097	.312384-04
37	11	2260000.00	3595000.000	10.9609	241.1272	2794.1579	.254319-04
38	11	2320000.00	3595000.000	11.2996	239.2926	2750.0330	.339923-05
39	11	2380000.00	3595000.000	11.7143	228.2623	2527.4547	-.156544-04
40	11	2440000.00	3595000.000	11.5843	223.9231	2504.5806	-.197021-04
41	11	2500000.00	3595000.000	11.5843	223.9231	2504.5806	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	12	100000.000	3600000.000	8.8274	221.6738	2882.9248	.000000
2	12	150000.000	3600000.000	8.8274	221.6738	2882.9248	.143982-04
3	12	200000.000	3600000.000	8.5110	220.6003	2893.0649	.145576-04
4	12	300000.000	3600000.000	8.0923	218.5231	3015.5426	.139199-04
5	12	320000.000	3600000.000	7.6172	217.1089	3091.0474	.130576-04
6	12	330000.000	3600000.000	7.1828	216.3215	3163.9418	.345166-05
7	12	335000.000	3600000.000	6.7140	216.9517	3194.2566	-.461531-05
8	12	340000.000	3600000.000	6.4916	217.2320	3228.1849	.838822-06
9	12	345000.000	3600000.000	6.4349	218.6769	3245.6982	.160604-04
10	12	350000.000	3600000.000	6.5639	220.2959	3168.0933	.367216-04
11	12	355000.000	3600000.000	7.2395	224.6838	3218.3701	-.349993-04
12	12	360000.000	3600000.000	7.0000	231.9344	3118.6109	-.100671-03
13	12	365000.000	3600000.000	5.9971	227.9123	3108.7383	-.956832-04
14	12	370000.000	3600000.000	5.2032	221.6150	3188.7484	-.950000-04
15	12	375000.000	3600000.000	4.6114	223.2064	3239.1486	-.635534-04
16	12	380000.000	3600000.000	4.3364	224.8710	3240.0445	-.242072-04
17	12	385000.000	3600000.000	4.2545	225.6666	3247.9610	.142260-04
18	12	390000.000	3600000.000	4.2687	227.2630	3241.3203	.501125-04
19	12	395000.000	3600000.000	4.4639	226.6383	3247.2307	.714481-04
20	12	400000.000	3600000.000	4.3820	228.5851	3253.5641	.869606-04
21	12	405000.000	3600000.000	4.4613	228.2321	3281.4547	.868781-04
22	12	410000.000	3600000.000	4.5728	229.0241	3291.6798	.773649-04
23	12	415000.000	3600000.000	4.5816	231.4451	3300.3574	.708313-04
24	12	420000.000	3600000.000	4.5227	235.1250	3309.1996	.809188-04
25	12	425000.000	3600000.000	4.8708	240.3977	3357.9653	.650447-04
26	12	430000.000	3600000.000	5.4941	250.8486	3318.5531	.505406-04
27	12	435000.000	3600000.000	6.1554	248.9536	3259.1216	.909777-06
28	12	440000.000	3600000.000	6.3541	253.7385	3262.5338	.163109-04
29	12	445000.000	3600000.000	7.0105	249.1450	3169.1520	.294229-06
30	12	450000.000	3600000.000	7.8610	246.1017	3118.5269	.667017-05
31	12	455000.000	3600000.000	9.3526	249.1087	3069.5483	.337469-04
32	12	460000.000	3600000.000	10.7200	248.1747	2863.8696	.164346-04
33	12	465000.000	3600000.000	10.4597	245.3615	2820.4304	.177205-04
34	12	470000.000	3600000.000	10.3204	245.1898	2863.6818	.112995-04
35	12	475000.000	3600000.000	10.3529	244.6644	2802.0855	.783399-05
36	12	480000.000	3600000.000	10.9659	248.8758	2670.9350	.454175-04
37	12	485000.000	3600000.000	11.0904	242.3116	2736.4253	.380524-04
38	12	490000.000	3600000.000	11.5583	235.0586	2690.4943	.101515-04
39	12	495000.000	3600000.000	12.1717	227.0213	2452.9033	-.117785-04
40	12	500000.000	3600000.000	12.3043	222.8464	2448.3318	-.188335-04
41	12	505000.000	3600000.000	12.3043	222.8464	2448.3318	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	13	1x0000.000	3605000.000	8.9249	221.0147	2875.2413	.000000
2	13	1x0050.000	3605000.000	8.9249	221.0147	2875.2413	.148222-04
3	13	2x0000.000	3605000.000	8.4562	220.0875	2898.4539	.153660-04
4	13	3x0000.000	3605000.000	7.9847	218.5548	3034.3564	.155275-04
5	13	3200x0.000	3605000.000	7.2919	217.2975	3129.8821	.135363-04
6	13	3300x0.000	3605000.000	6.8153	216.3328	3200.3529	.327533-05
7	13	3350x0.000	3605000.000	6.5396	216.3398	3228.0957	-.591534-05
8	13	3400x0.000	3605000.000	6.4066	216.7519	3236.9874	-.154540-05
9	13	3450x0.000	3605000.000	6.3796	217.6261	3245.9593	.610811-05
10	13	3500x0.000	3605000.000	6.2835	217.0303	3191.0605	-.427443-06
11	13	3550x0.000	3605000.000	6.7948	224.5604	3392.5936	-.334764-05
12	13	3600x0.000	3605000.000	7.5625	229.6329	3210.3935	-.356175-04
13	13	3650x0.000	3605000.000	6.6235	224.9529	3211.9758	-.732899-04
14	13	3700x0.000	3605000.000	5.5349	222.2871	3177.2498	-.827911-04
15	13	3750x0.000	3605000.000	4.6951	220.8269	3242.0426	-.808072-04
16	13	3x0000.000	3605000.000	4.4008	223.4736	3246.7262	-.521851-04
17	13	3850x0.000	3605000.000	4.1772	224.5574	3251.4457	-.155553-04
18	13	3900x0.000	3605000.000	4.0677	225.4279	3258.9152	.211858-04
19	13	3950x0.000	3605000.000	4.0585	225.9084	3266.5242	.504103-04
20	13	4000x0.000	3605000.000	4.0985	226.0653	3281.9366	.696950-04
21	13	4050x0.000	3605000.000	4.1731	225.5271	3292.1973	.786852-04
22	13	4100x0.000	3605000.000	4.1893	226.0096	3300.1956	.790516-04
23	13	4150x0.000	3605000.000	4.1582	227.6118	3309.7998	.784654-04
24	13	4200x0.000	3605000.000	4.1918	231.0859	3299.9954	.839979-04
25	13	4250x0.000	3605000.000	4.2276	235.6677	3251.7377	.737401-04
26	13	4300x0.000	3605000.000	5.0769	240.1087	3373.1664	.458847-04
27	13	4350x0.000	3605000.000	6.3273	249.9517	3194.4240	.221258-04
28	13	4400x0.000	3605000.000	6.6647	249.2555	3229.1228	.716023-05
29	13	4450x0.000	3605000.000	7.5102	249.8851	3139.3812	.261901-05
30	13	4500x0.000	3605000.000	8.4031	248.1366	3017.8291	.116845-04
31	13	4550x0.000	3605000.000	9.3775	240.5616	2945.8521	.259217-04
32	13	4600x0.000	3605000.000	11.1733	245.9647	2735.1176	.241629-04
33	13	4650x0.000	3605000.000	10.5390	245.2534	2704.9079	.282631-04
34	13	4700x0.000	3605000.000	10.3941	241.9396	2811.8046	-.887522-05
35	13	4750x0.000	3605000.000	10.6620	241.7863	2869.3190	-.941432-06
36	13	4800x0.000	3605000.000	11.1606	243.1704	2852.9225	.414405-04
37	13	4850x0.000	3605000.000	11.7037	238.5769	2807.4930	.379240-04
38	13	4900x0.000	3605000.000	12.3726	231.7064	2699.5860	.134475-04
39	13	4950x0.000	3605000.000	12.8078	225.0151	2342.9382	-.679363-05
40	13	5000x0.000	3605000.000	12.7902	221.6903	2388.4892	-.166050-04
41	13	5050x0.000	3605000.000	12.7902	221.6903	2388.4892	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	14	1000000.000	3610000.000	8.8330	220.2678	2865.7363	.000000
2	14	1050000.000	3610000.000	8.8330	220.2678	2865.7363	.153676-04
3	14	2000000.000	3610000.000	8.4340	219.3181	2895.9941	.163932-04
4	14	3000000.000	3610000.000	7.7892	217.7795	3041.0376	.168640-04
5	14	3500000.000	3610000.000	7.1526	216.3067	3145.8813	.132643-04
6	14	4000000.000	3610000.000	6.7082	215.2515	3212.3957	.223729-05
7	14	4050000.000	3610000.000	6.4851	215.1988	3234.0855	-.822830-05
8	14	5000000.000	3610000.000	6.3416	216.0078	3242.8461	-.241652-05
9	14	5050000.000	3610000.000	6.3200	217.4536	3248.9793	.141485-04
10	14	6000000.000	3610000.000	6.4376	218.6480	3159.3247	.331852-04
11	14	6050000.000	3610000.000	7.0892	225.1507	3217.8434	.239356-04
12	14	7000000.000	3610000.000	8.1102	224.7867	3065.4691	-.236454-04
13	14	7050000.000	3610000.000	8.7184	223.6813	3050.0592	-.642509-04
14	14	8000000.000	3610000.000	5.1253	217.9060	3194.0817	-.809028-04
15	14	8050000.000	3610000.000	4.8048	219.6232	3245.9700	-.786237-04
16	14	9000000.000	3610000.000	4.4994	221.9021	3244.1413	-.642080-04
17	14	9050000.000	3610000.000	4.1948	223.0488	3253.2154	-.355785-04
18	14	9500000.000	3610000.000	4.0276	223.4693	3264.1880	-.126706-05
19	14	9950000.000	3610000.000	3.9675	223.3476	3273.8168	.300941-04
20	14	10000000.000	3610000.000	3.9614	222.7497	3282.6512	.539137-04
21	14	10050000.000	3610000.000	3.9367	221.5703	3288.7205	.690458-04
22	14	10100000.000	3610000.000	3.8719	221.0254	3312.0424	.785920-04
23	14	10150000.000	3610000.000	3.8051	221.5069	3323.6293	.733591-04
24	14	10200000.000	3610000.000	3.5722	223.3362	3311.7472	.507132-04
25	14	10250000.000	3610000.000	3.6004	234.3567	3365.4278	.480411-04
26	14	10300000.000	3610000.000	5.1269	241.8255	3377.8567	.376646-04
27	14	10350000.000	3610000.000	6.1186	252.3320	3219.6213	.448996-04
28	14	10400000.000	3610000.000	6.6971	254.1977	3159.8320	.417037-04
29	14	10450000.000	3610000.000	7.7591	250.0533	3104.0901	.285103-04
30	14	10500000.000	3610000.000	9.2918	246.7421	3031.1444	.189135-04
31	14	10550000.000	3610000.000	10.9000	245.2670	2856.2975	.118968-04
32	14	10600000.000	3610000.000	11.2569	244.4661	2688.3154	.251469-04
33	14	10650000.000	3610000.000	10.8758	241.5075	2893.3159	.822387-05
34	14	10700000.000	3610000.000	11.4331	240.2314	2776.8701	.190341-04
35	14	10750000.000	3610000.000	11.9358	237.5311	2695.7834	.154167-04
36	14	10800000.000	3610000.000	12.5050	235.0939	2562.7072	.433437-04
37	14	10850000.000	3610000.000	13.0494	231.6527	2517.7067	.255143-04
38	14	10900000.000	3610000.000	13.5133	228.6872	2469.9437	.550673-05
39	14	10950000.000	3610000.000	13.3668	225.0693	2249.3380	-.635733-05
40	14	11000000.000	3610000.000	13.1030	220.8037	2339.2195	-.138511-04
41	14	11050000.000	3610000.000	13.1030	220.8037	2339.2195	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	15	1u0000.000	3615000.000	8.9482	219.4672	2855.5150	.000000
2	15	160000.000	3615000.000	8.8482	219.4672	2855.5150	.158946-04
3	15	220000.000	3615000.000	8.4245	218.4113	2889.3083	.171681-04
4	15	280000.000	3615000.000	7.7375	216.6509	3048.4140	.173573-04
5	15	340000.000	3615000.000	7.0878	214.8851	3161.1378	.132457-04
6	15	400000.000	3615000.000	6.6677	213.7637	3227.0963	.330988-05
7	15	3450u0.000	3615000.000	6.4602	213.9668	3239.6231	-.629385-05
8	15	340000.000	3615000.000	6.2932	214.8193	3245.8908	-.309167-05
9	15	3450u0.000	3615000.000	6.2320	215.7045	3260.4299	.176640-04
10	15	350000.000	3615000.000	6.1496	213.9550	3160.2948	.304600-04
11	15	355000.000	3615000.000	6.9943	226.9005	3442.2557	.544748-04
12	15	360000.000	3615000.000	8.2957	227.2772	2890.7097	-.728610-05
13	15	365000.000	3615000.000	5.7376	218.9908	3116.7492	-.511351-04
14	15	370000.000	3615000.000	5.1323	217.7313	3254.7400	-.658474-04
15	15	375000.000	3615000.000	4.9760	219.4340	3254.6342	-.702714-04
16	15	380000.000	3615000.000	4.6081	221.1371	3245.1006	-.634493-04
17	15	385000.000	3615000.000	4.2954	221.7594	3253.3698	-.416022-04
18	15	390000.000	3615000.000	4.1105	221.6734	3260.6682	-.120797-04
19	15	395000.000	3615000.000	3.9314	221.4009	3271.2403	.168800-04
20	15	400000.000	3615000.000	3.8931	219.3157	3278.6120	.403426-04
21	15	405000.000	3615000.000	3.8024	217.2119	3293.9802	.605853-04
22	15	410000.000	3615000.000	3.7097	215.0596	3319.4665	.698325-04
23	15	415000.000	3615000.000	3.6609	213.3909	3286.4636	.588872-04
24	15	420000.000	3615000.000	3.0440	221.1475	3287.4911	.199233-04
25	15	425000.000	3615000.000	3.6421	231.0210	3344.8459	-.108365-04
26	15	430000.000	3615000.000	4.5928	241.1688	3262.9456	.262360-04
27	15	435000.000	3615000.000	5.2137	250.0192	3274.3219	.563613-04
28	15	440000.000	3615000.000	6.9430	252.0804	3297.7318	.663934-04
29	15	445000.000	3615000.000	9.2961	247.5507	3021.1167	.465790-04
30	15	450000.000	3615000.000	10.6550	243.3500	2822.6364	.197860-04
31	15	455000.000	3615000.000	11.5857	242.2080	2720.9205	-.145956-05
32	15	460000.000	3615000.000	11.9535	242.2436	2652.0179	.313793-04
33	15	465000.000	3615000.000	12.2049	237.8874	2604.4930	.340806-05
34	15	470000.000	3615000.000	12.1746	236.9299	2618.8129	.198352-04
35	15	475000.000	3615000.000	12.7277	235.8884	2519.6696	.272456-05
36	15	480000.000	3615000.000	13.1622	234.0624	2515.8681	.271826-04
37	15	485000.000	3615000.000	13.6987	230.0307	2453.0059	.211498-04
38	15	490000.000	3615000.000	13.9855	225.3871	2403.7852	.402527-05
39	15	495000.000	3615000.000	13.6623	222.1956	2203.1852	-.560356-05
40	15	500000.000	3615000.000	13.5043	220.4319	2310.0185	-.113935-04
41	15	710000.000	3615000.000	13.5043	220.4319	2310.0185	.000000

** WIND FIELD, LAYER HEIGHT, AND VORTICITY AT TIME STEP 131 (5.00499 HOURS) **

X INDEX I	Y INDEX J	X COORDINATE (METERS)	Y COORDINATE (METERS)	WIND SPEED (METERS/SEC)	DIRECTION (DEGREES)	LAYER HEIGHT (METERS)	VORTICITY
1	19	100000.000	3620000.000	8.8682	216.6276	2844.7975	.000000
2	19	160000.000	3620000.000	8.8682	218.6276	2844.7975	.164008-04
3	19	220000.000	3620000.000	8.4188	217.4603	2882.4034	.179422-04
4	19	280000.000	3620000.000	7.6878	215.5250	3041.4296	.175785-04
5	16	340000.000	3620000.000	7.0246	213.5389	3154.6446	.124257-04
6	19	338000.000	3620000.000	6.6282	212.2248	3215.4731	.205155-05
7	19	335000.000	3620000.000	6.4336	212.2904	3233.8336	-.604343-05
8	16	340000.000	3620000.000	6.3344	213.1288	3249.1198	-.636961-05
9	16	345000.000	3620000.000	6.3858	214.1924	3253.3985	-.160850-04
10	16	350000.000	3620000.000	6.1849	211.9250	3125.6031	-.258328-05
11	19	355000.000	3620000.000	7.8093	219.8931	3437.5041	.107453-05
12	19	360000.000	3620000.000	7.5153	220.7224	2914.4924	.242522-04
13	16	365000.000	3620000.000	5.5242	210.9054	3180.9863	-.124135-04
14	16	370000.000	3620000.000	5.3009	217.0110	3261.5825	-.333321-04
15	16	375000.000	3620000.000	5.0866	218.6716	3235.9291	-.500474-04
16	19	380000.000	3620000.000	4.7090	219.5799	3246.6989	-.496800-04
17	19	385000.000	3620000.000	4.4462	220.3126	3255.1843	-.331465-04
18	16	390000.000	3620000.000	4.1947	218.9404	3260.5274	-.107359-04
19	16	395000.000	3620000.000	4.0531	218.0160	3297.9158	.130063-04
20	16	400000.000	3620000.000	3.9648	216.6166	3279.4136	.405224-04
21	19	405000.000	3620000.000	3.8159	212.1788	3299.4791	.657115-04
22	19	410000.000	3620000.000	3.8613	208.9931	3285.7046	.644044-04
23	16	415000.000	3620000.000	3.8489	202.9417	3210.9254	.356429-04
24	16	420000.000	3620000.000	3.1173	208.4834	3419.8619	-.824764-05
25	16	425000.000	3620000.000	3.7129	252.7649	3355.6018	-.235520-04
26	16	430000.000	3620000.000	4.3301	239.8462	3315.8095	-.183213-04
27	19	435000.000	3620000.000	5.7773	243.8490	3304.7007	.407662-04
28	19	440000.000	3620000.000	8.4711	242.9518	3107.6776	.471727-04
29	19	445000.000	3620000.000	10.5369	244.0038	2796.4747	.609803-04
30	16	450000.000	3620000.000	11.4900	241.5392	2721.8178	.117787-04
31	19	455000.000	3620000.000	12.3501	240.0731	2644.8709	.610984-05
32	19	460000.000	3620000.000	12.7609	239.3045	2589.4755	.158313-04
33	19	465000.000	3620000.000	12.6572	238.8806	2527.4658	.845901-05
34	19	470000.000	3620000.000	12.5499	239.5182	2640.6579	.100726-04
35	19	475000.000	3620000.000	13.3905	238.2209	2506.9677	.379418-04
36	19	480000.000	3620000.000	14.0940	235.0448	2375.8665	.348198-04
37	19	485000.000	3620000.000	14.2679	229.6890	2352.5346	.201234-04
38	19	490000.000	3620000.000	14.2292	224.7220	2338.0473	.124933-05
39	19	495000.000	3620000.000	13.7209	222.1341	2169.0634	-.668000-05
40	19	500000.000	3620000.000	13.3537	220.5222	2299.0638	-.984389-05
41	19	505000.000	3620000.000	13.3537	220.5222	2299.0638	.000000

** OUTPUT TAPE INFORMATION **

NUMBER OF TIMES OUTPUT OF THE U AND V WIND COMPONENTS AND LAYER HEIGHT ARE DESIRED - 2
NUMBER OF TIMES OUTPUT OF THE U AND V WIND COMPONENTS AND LAYER HEIGHT WAS COMPLETED - 2
TIME STEP NUMBER AND TIME (MINUTES) OF EACH OUTPUT
(79,180.3411), (131,300.2996), (
SIZE OF I DIMENSION OF UL,VL,PL AND HG - 41
SIZE OF J DIMENSION OF UL,VL,PL AND HG - 41
NUMBER OF COORDINATES IN X AXIS (IN IDIM) - 41
NUMBER OF COORDINATES IN Y AXIS (IN JDIM) - 41
INDEX OF THE BEGINNING COORDINATE ON THE X AXIS OF UNIFORM GRID SPACING - 6
INDEX OF THE ENDING COORDINATE ON THE X AXIS OF UNIFORM GRID SPACING - 36
INDEX OF THE BEGINNING COORDINATE ON THE Y AXIS OF UNIFORM GRID SPACING - 6
INDEX OF THE ENDING COORDINATE ON THE Y AXIS OF UNIFORM GRID SPACING - 36

TERRAIN HEIGHTS WERE WRITTEN TO TAPE

TAPE OUTPUT WAS WRITTEN TO UNIT 1

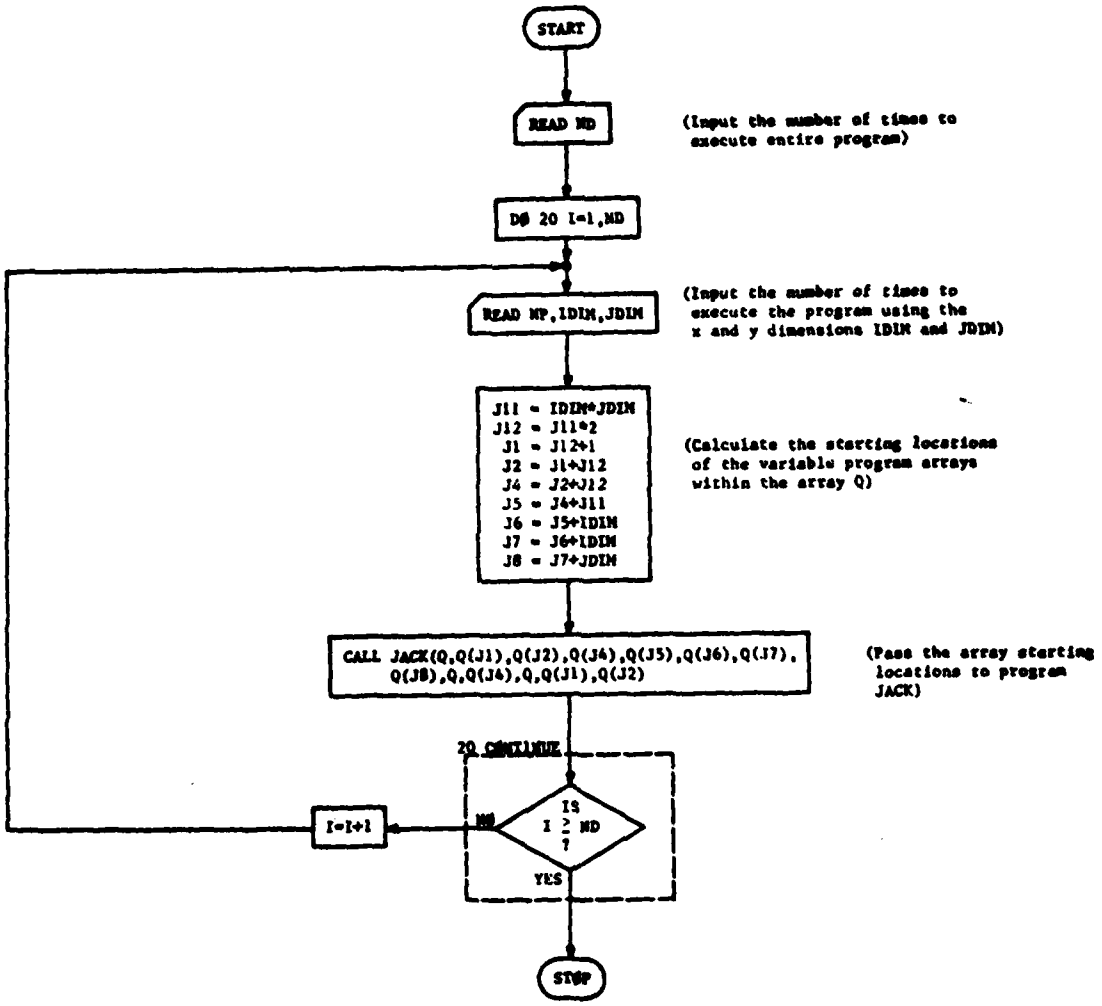
APPENDIX D

COMPUTER PROGRAM FLOW DIAGRAM

Appendix D contains detailed flow diagrams of the ASL/WSMR Wind Field Terrain Adjustment Program.

D.1 PROGRAM MODEL

This program reads the object time dimension limits and calculates the relative addresses of the program arrays that depend on grid size and passes the addresses to the main calculation routine JACK.



D.2 SUBROUTINE JACK(UL,VL,PL,NQ,DELXI,DXPI,DELYJ,DYPJ,CONTP,NOQ,ULQ,VLQ,PLQ)

This is the main calculation routine. Subroutine JACK inputs the majority of the program control and model parameters. The program inputs the terrain via subroutine MOUNTN, calculates and sets initial conditions and then enters the time loop that calculates the vector components of the wind speed and the surface layer heights. At the end of each time loop, the program checks to determine if printing or tape output of the wind field is desired for the present time step. When the time loop has been completed, the program loops to the next problem in sequence if present.

PROGRAM VARIABLES

DELXI - Array containing the inverse of [X(I+1) - X(I-1)] to minimize divisions in the time loop.

DELYJ - Array containing the inverse of [Y(J+1) - Y(J-1)] to minimize divisions in the time loop.

DXPI - Array containing the inverse of [X(I+1) - X(I)] to minimize divisions in the time loop.

DYPJ - Array containing the inverse of [Y(J+1) - Y(J)] to minimize divisions in the time loop.

DT - Time increment for the time loop.

TIM - Total time in seconds of the time loop.

HG=HGQ - Array containing the terrain heights.

JL - Number of grid points in the y-axis.

LL - Number of grid points in the x-axis.

LLM - LL-1

JLM - JL-1

UL(I,J,K) = ULQ(I+(J-1)*IDIM+(K-1)*IDIM*JDIM) - The u component of the wind speed times the layer depth where K = 2 is the present time step and K = 1 is the past time step.

VL(I,J,K) = VLQ(I+(J-1)*IDIM*(K-1)*IDIM*JDIM) - The v component of the wind speed times the layer depth.

PL(I,J,K) = PLQ((I+(J-1)*IDIM+(K-1)*IDIM*JDIM) - The surface layer depth.

ULT - The initial u component of the wind speed or the mean wind speed depending on ISKIP(4).

VLT - The initial v component of the wind speed or the direction depending on ISKIP(4).

PLT - The initial height of the surface layer.

X - Array containing the x-axis of the reference coordinate system.

Y - Array containing the y-axis of the reference coordinate system.

PRINT - Array containing the time in minutes at which the wind field and layer heights are to be output within the time loop. Values are in ascending order and the maximum is used as the stop value.

IST - Index of the first point in the x array at which uniform grid spacing occurs along the x-axis. This value and IND, JST, and JND below are output to tape for use in plotting the area of uniform grid spacing.

JST - Index of the first point in the y array at which uniform grid spacing occurs along the y axis.

IND,JND - The ending indices in the x and y arrays at which uniform grid spacing stops.

NCNT - Number of iterative time steps between the recalculation of the time step increment DT.

DTLMDA - Stability factor for calculating the time step DT and maintain DT at a critical value. This value should be as close to 1 as possible and still maintain program stability. Values of 0.90 to 0.95 generally maintain stability.

ISMØTH - Number of time steps between the applications of a nine point smoothing function.

G1 - Reduced gravity factor equal to g(1-S) where g is the acceleration of gravity (9.8 m/s^2) and S is the ratio of the potential temperature at the top of the layer over the potential temperature at the bottom of the layer.

ISKIP - Program control options. Refer to the user instructions or the program listing for details.

IUNIT - The Fortran logical tape unit for program tape output. If more than one reel is written, a 1 is added to IUNIT and a reel is assumed mounted on the next unit. A second reel will be required only if many time steps or many problems are being output. Refer to the user instructions or the program listing for the tape format.

ABLK - The minimum allowable layer depth.

XPS - Array containing the x axis of the standard WSMR grid in UTM (kilometers) coordinates.

YPS - Array containing the y axis of the standard WSMR grid in UTM (kilometers) coordinates..

SS - Constant used in the nine point smoothing function.

IRECG - Number of groups of UL, VL and PL output to tape in any one problem run.

MØUT - Array containing record one of each file output to tape.

STØP - Time of the last time step to process.

ITAG1 - Flag used to check if problem has tape output.

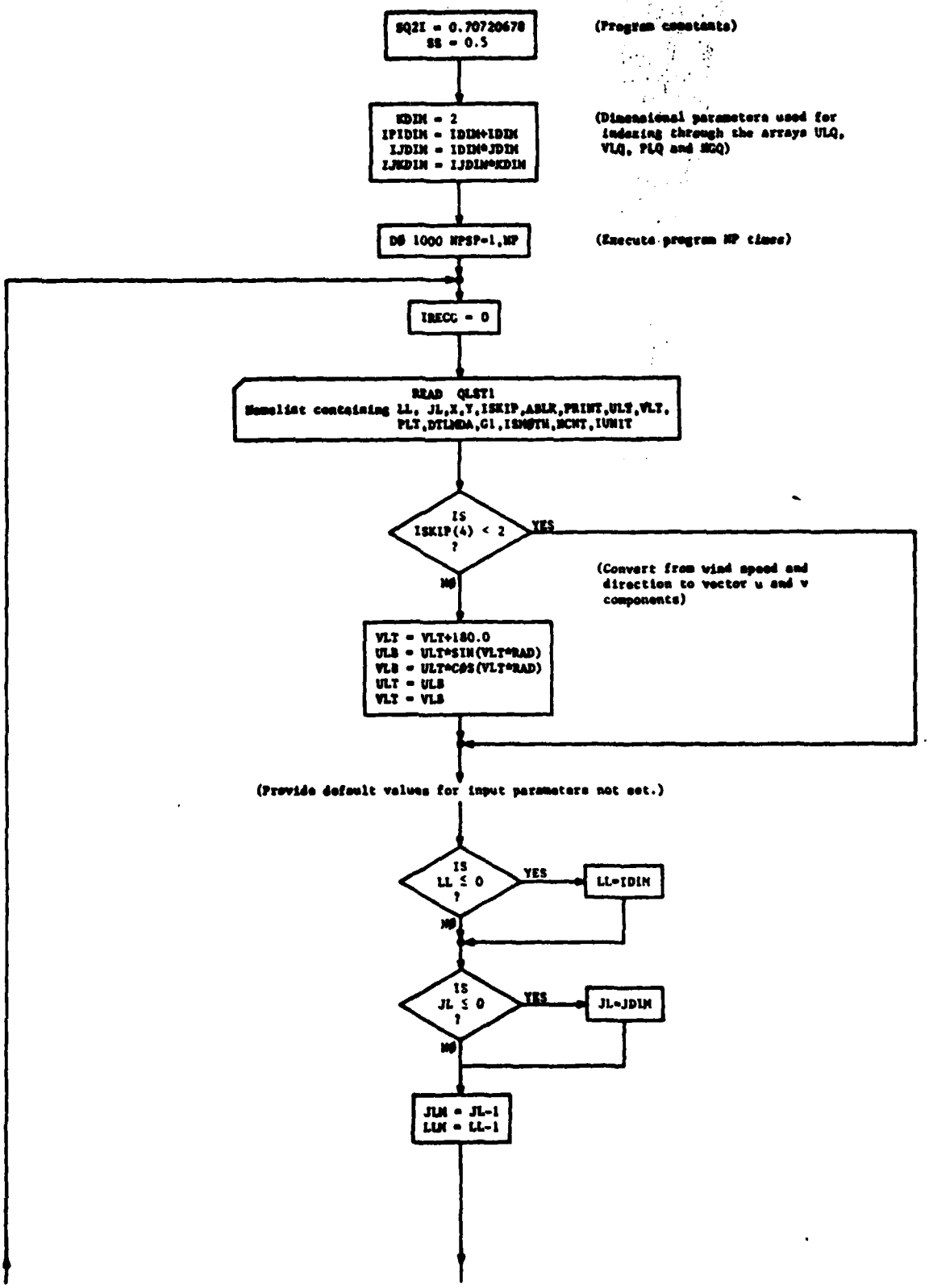
JPR - Counter for the PRINT array.

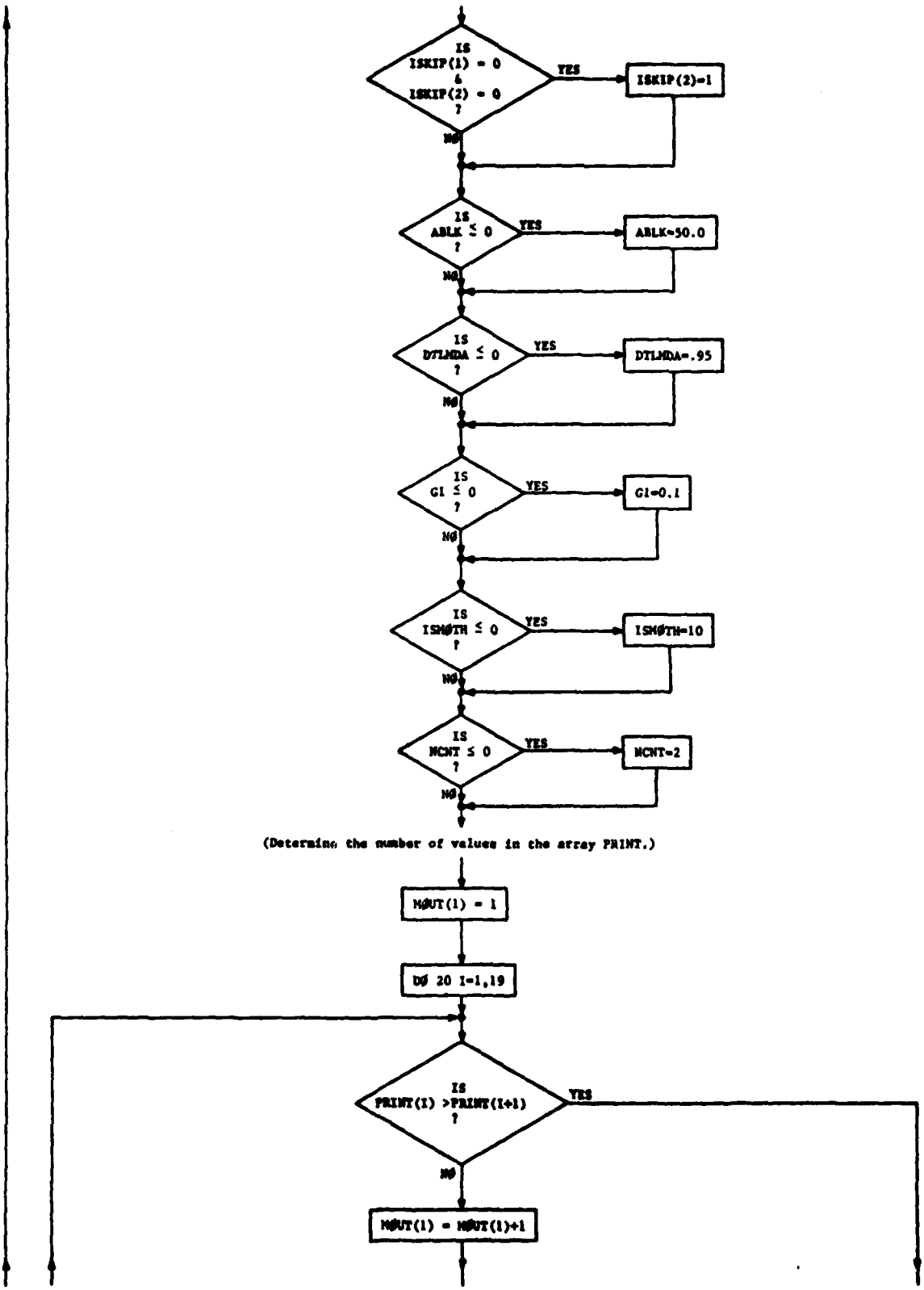
IFLAG - Program stability flag where if set to greater than zero the problem is stopped and the program goes to the next case.

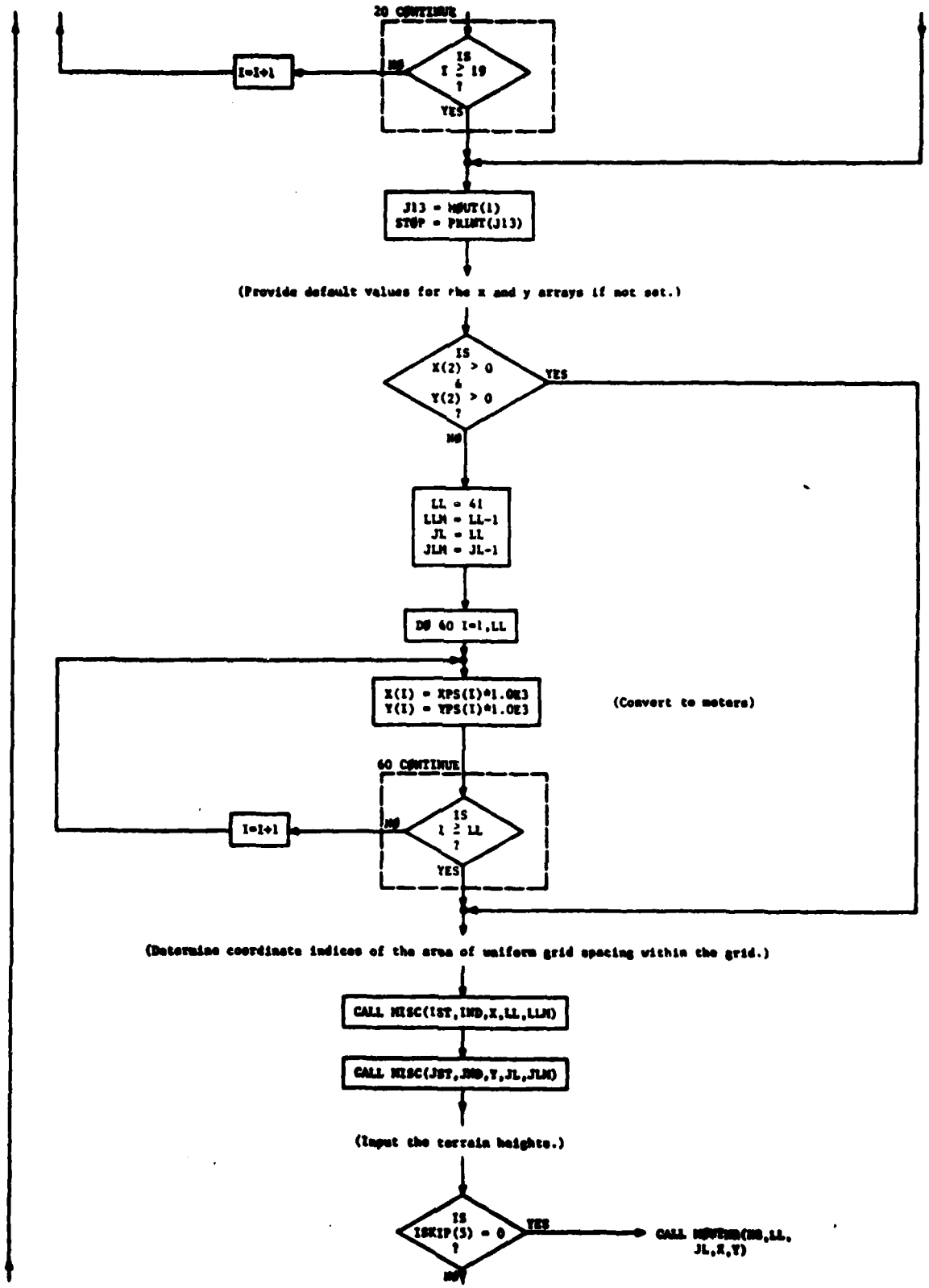
ISAVE - Time step number at which tape output occurs.

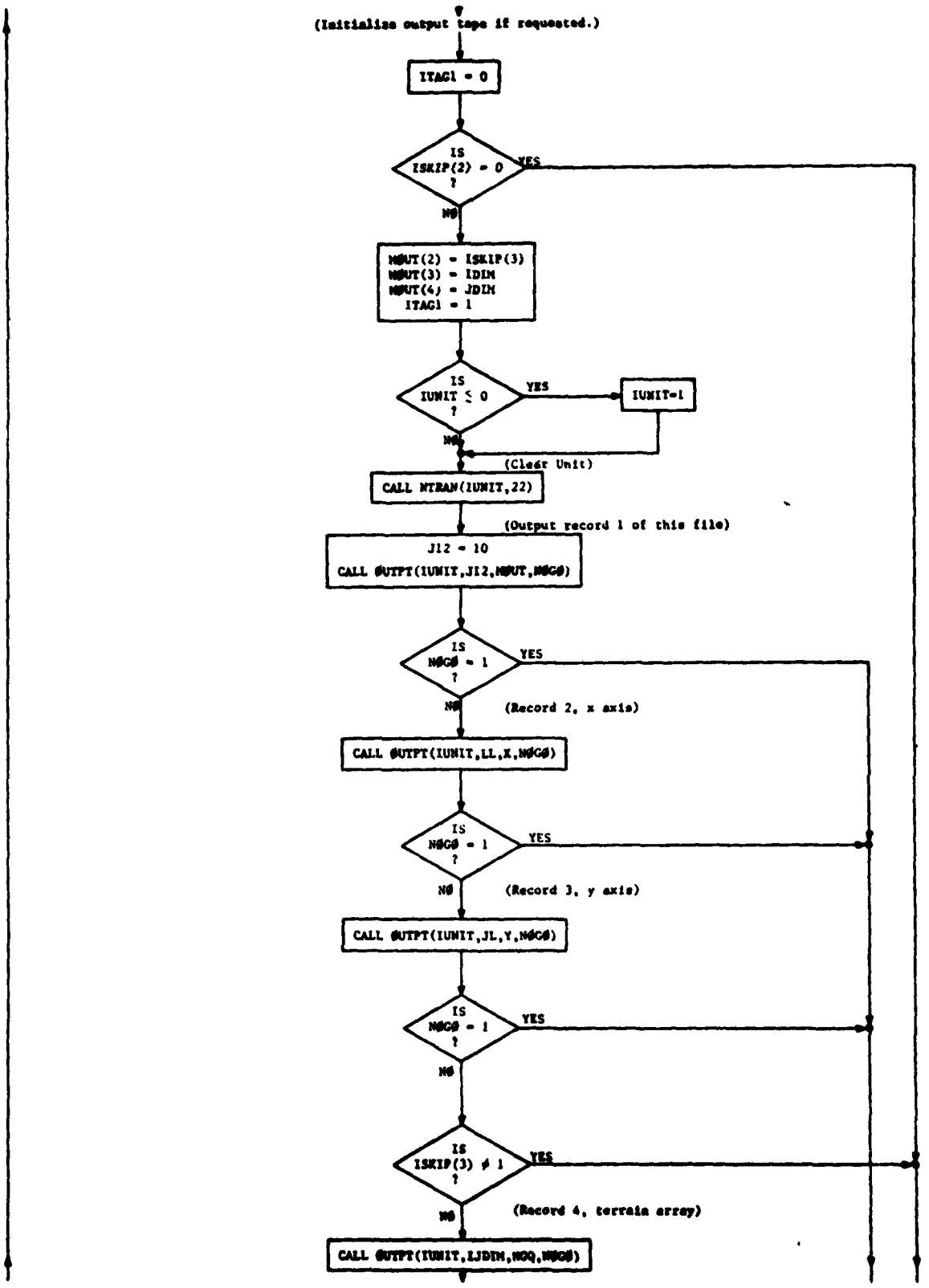
TSAVE - Time at which tape output occurs.

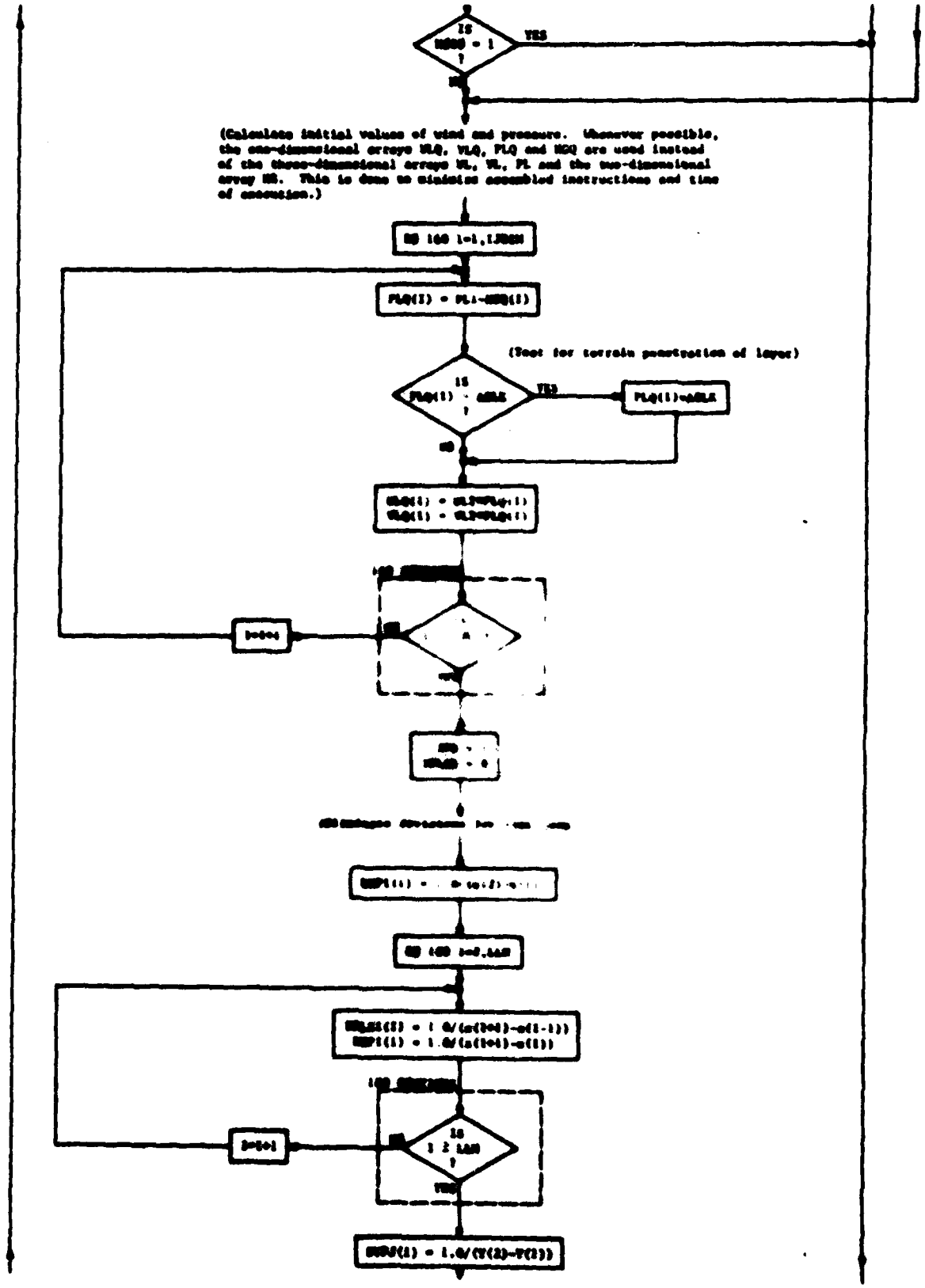
Other program variables are used for temporary storage and indexing.

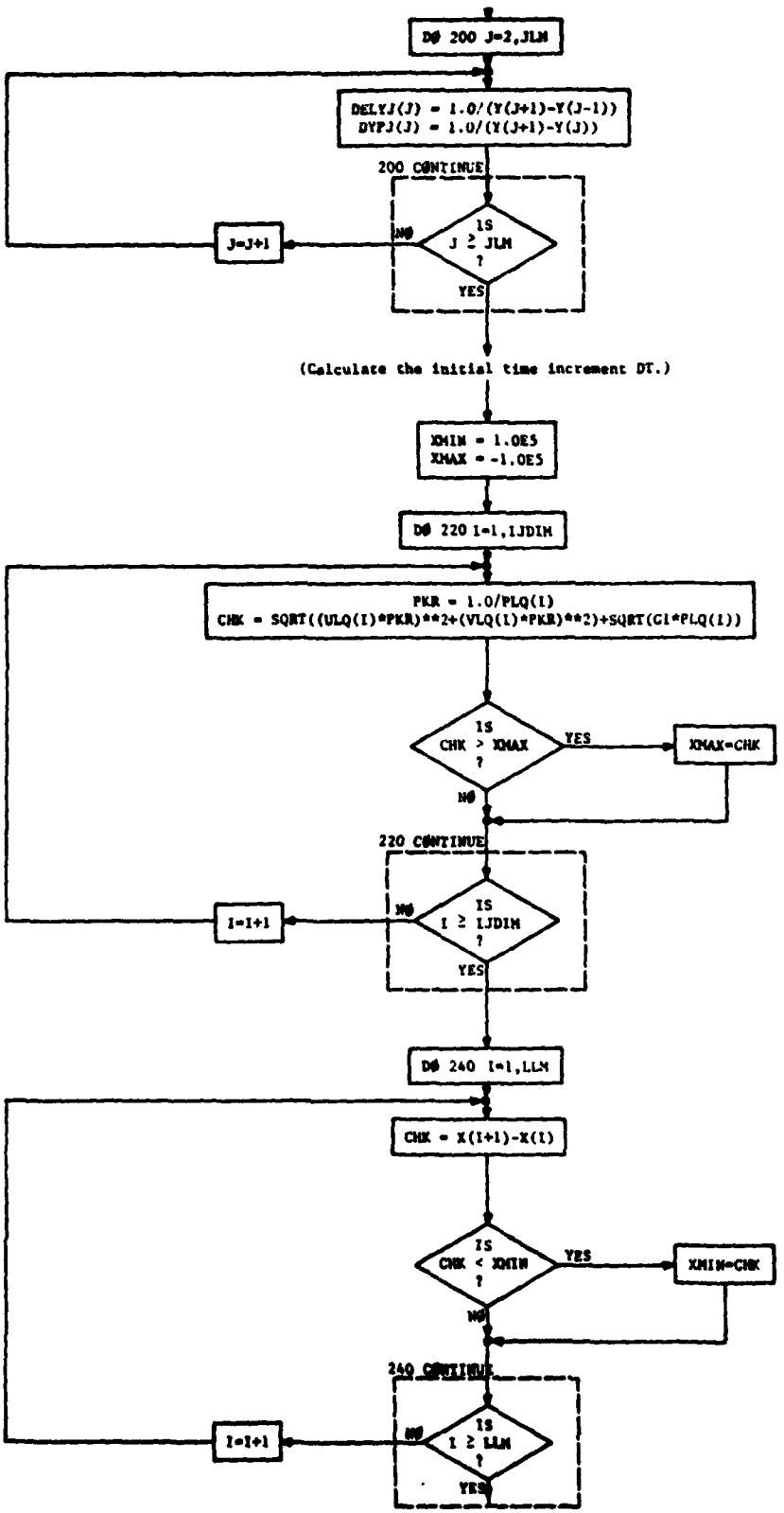

SQ2I = 0.70720678
SS = 0.5
(Program constants)
KDIM = 2
IPIDIM = IDIM+IDIM
IJDIM = IDIM*JDIM
IJKDIM = IJDIM*KDIM
(Dimensional parameters used for indexing through the arrays ULQ, VLQ, PLQ and MGQ)
DO 1000 NPSP=1,NP
(Execute program NP times)
IRECC = 0
READ QLST1
Namelist containing LL, JL,X,Y,ISKIP,ASLR,PRINT,ULT,VLT, PLT,DTLMDA,G1,ISMOTH,NCNT,IUNIT
IS ISKIP(4) < 2 ?
YES
NO
(Convert from wind speed and direction to vector u and v components)
VLT = VLT+180.0
ULS = ULT*SIN(VLT*RAD)
VLS = ULT*COS(VLT*RAD)
ULT = ULS
VLT = VLS
(Provide default values for input parameters not set.)
IS LL ≤ 0 ?
YES
LL=IDIM
NO
IS JL ≤ 0 ?
YES
JL=JDIM
NO
JLM = JL-1
LLM = LL-1

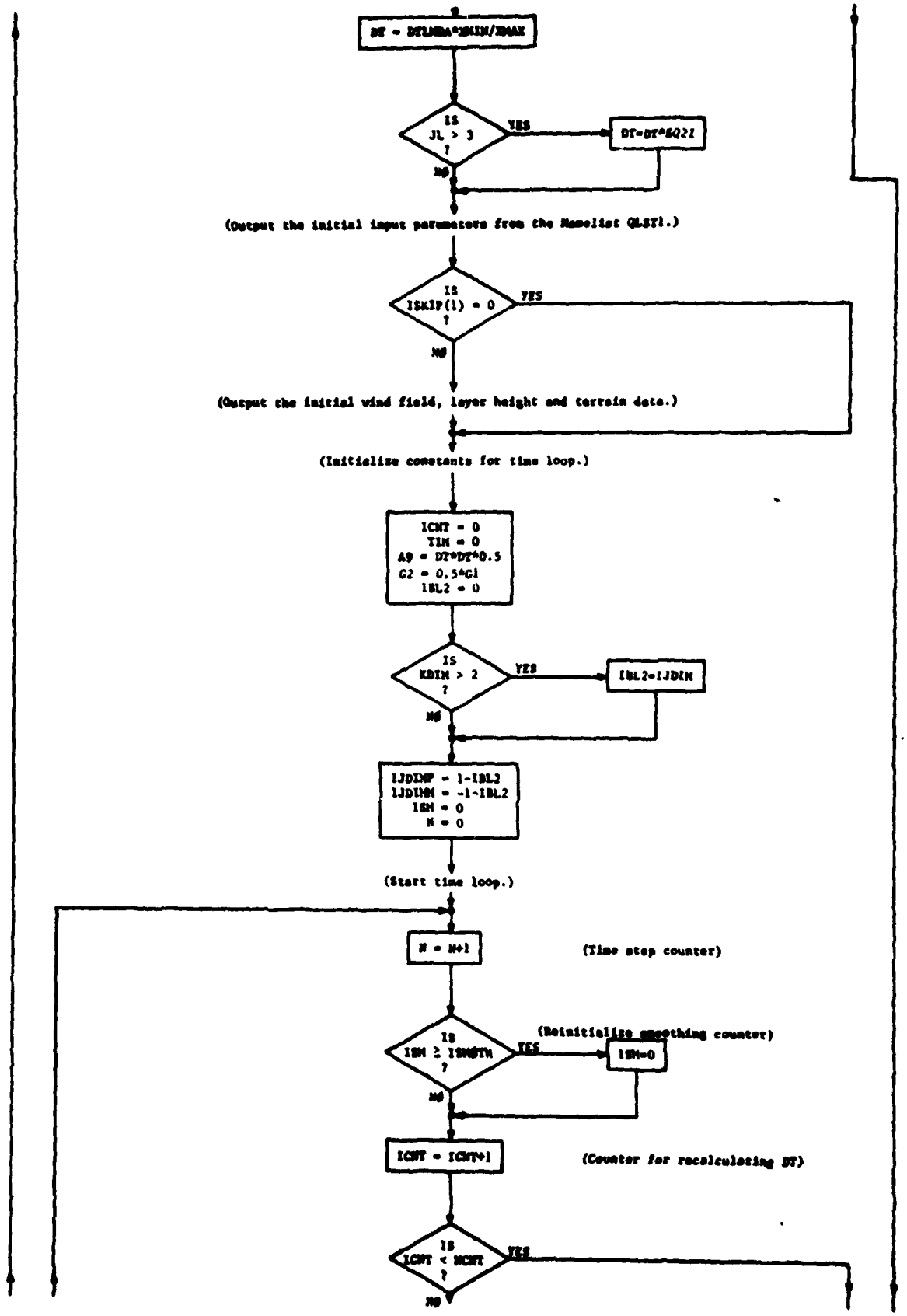

IS ISKIP(1) = 0 & ISKIP(2) = 0 ?
YES
ISKIP(2)=1
NØ
IS ABLK ≤ 0 ?
YES
ABLK=50.0
NØ
IS DTLMDA ≤ 0 ?
YES
DTLMDA=.95
NØ
IS G1 ≤ 0 ?
YES
G1=0.1
NØ
IS ISMØTH ≤ 0 ?
YES
ISMØTH=10
NØ
IS NCNT ≤ 0 ?
YES
NCNT=2
NØ
(Determine the number of values in the array PRINT.)
MØUT(1) = 1
DØ 20 I=1,19
IS PRINT(I) >PRINT(I+1) ?
YES
NØ
MØUT(1) = MØUT(1)+1

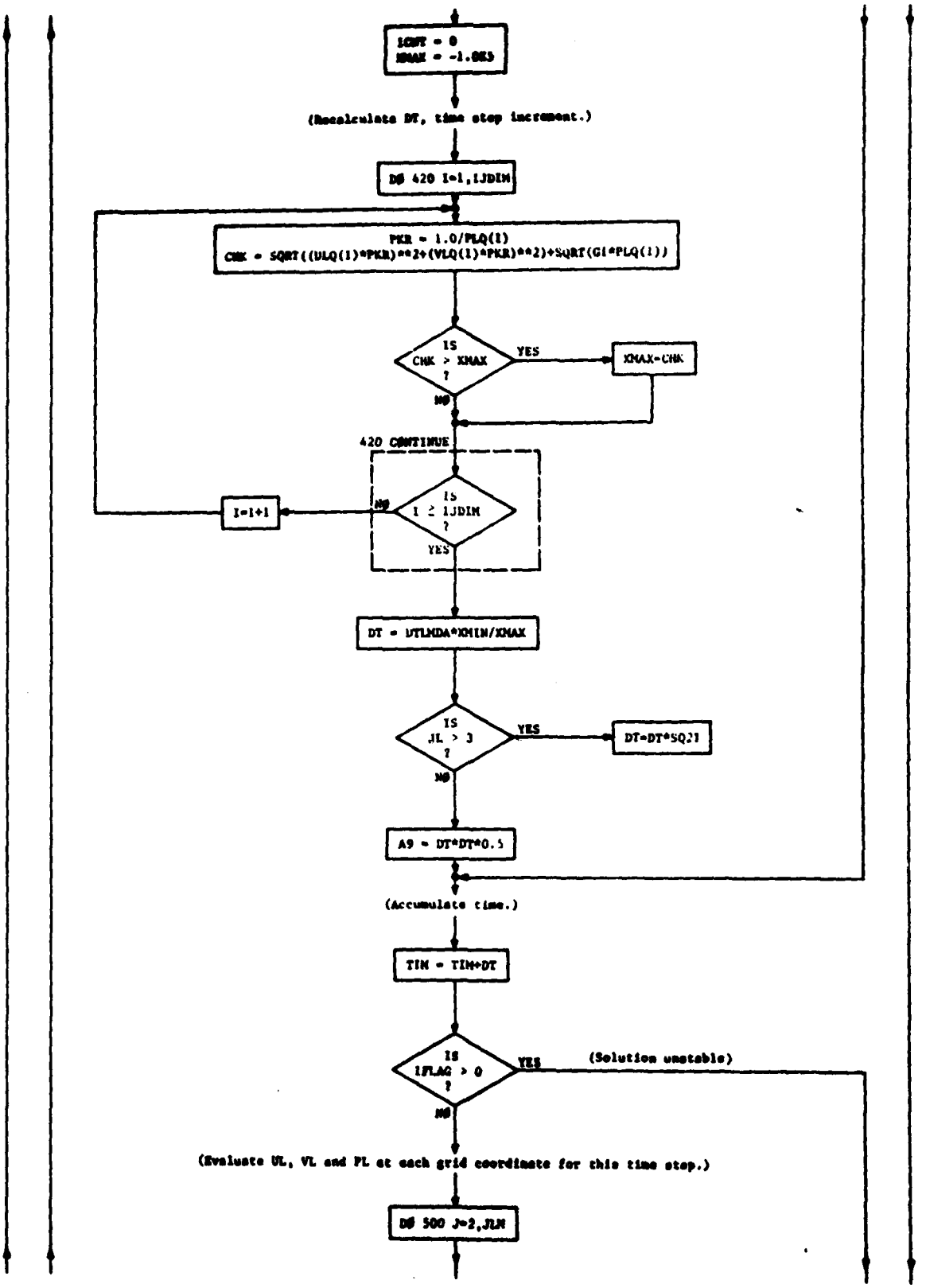

20 CONTINUE
IS I ≥ 19 ?
NO
YES
I=I+1
J13 = MOUT(1)
STOP = PRINT(J13)
(Provide default values for the x and y arrays if not set.)
IS X(2) > 0 & Y(2) > 0 ?
YES
NO
LL = 41
LLM = LL-1
JL = LL
JLM = JL-1
DO 60 I=1,LL
X(I) = XPS(I)*1.0E3
Y(I) = YPS(I)*1.0E3
(Convert to meters)
60 CONTINUE
IS I ≥ LL ?
NO
YES
I=I+1
(Determine coordinate indices of the area of uniform grid spacing within the grid.)
CALL MISC(IST,IND,X,LL,LLM)
CALL MISC(JST,JND,Y,JL,JLM)
(Input the terrain heights.)
IS ISKIP(5) = 0 ?
YES
NO
JL,X,Y)

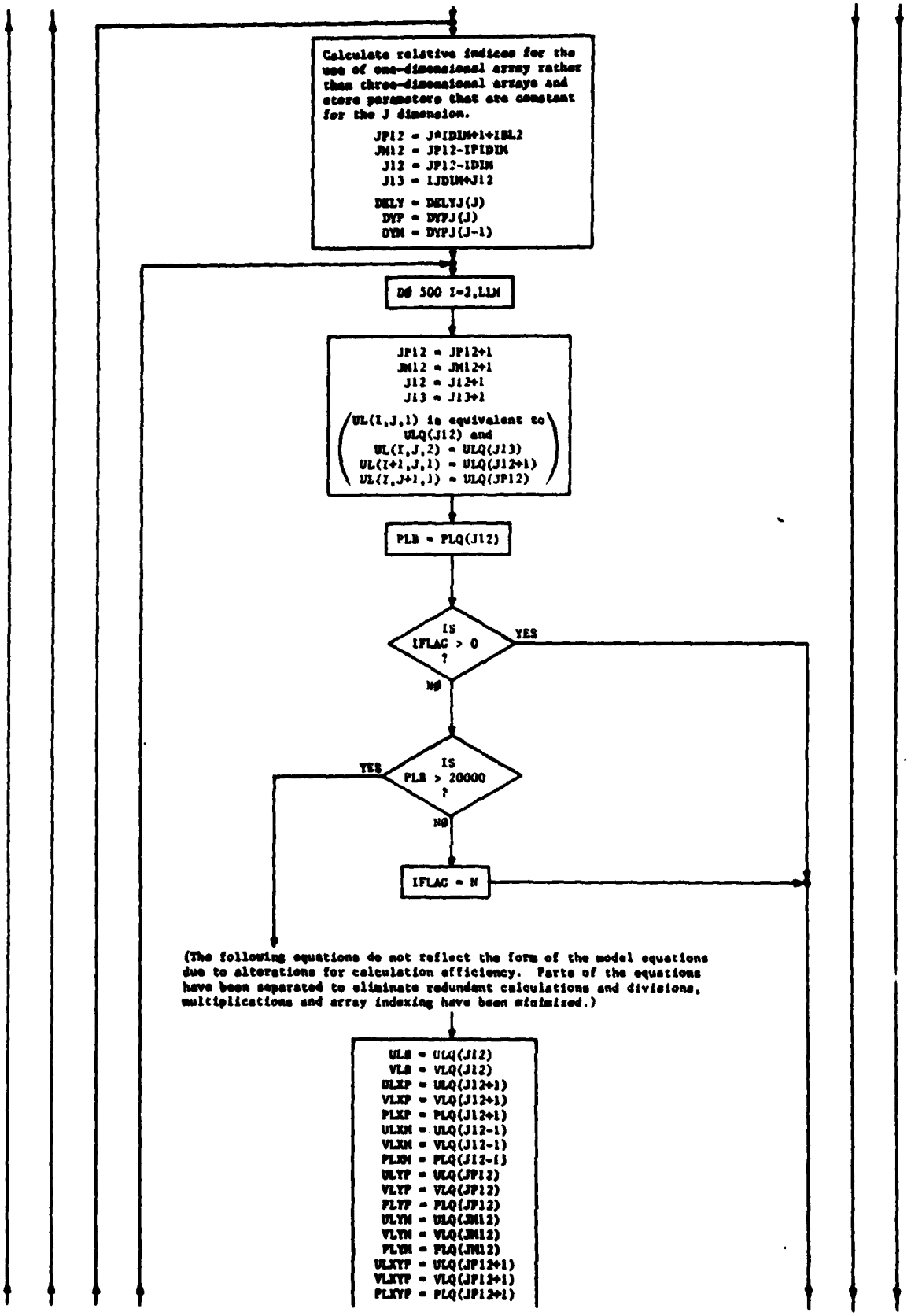

(Initialize output tape if requested.)
ITAG1 = 0
IS ISKIP(2) = 0 ?
YES
NO
NOUT(2) = ISKIP(3)
NOUT(3) = IDIM
NOUT(4) = JDIM
ITAG1 = 1
IS IUNIT ≤ 0 ?
YES
IUNIT=1
NO
(Clear Unit)
CALL NTRAN(IUNIT,22)
(Output record 1 of this file)
J12 = 10
CALL OUTPT(IUNIT,J12,NOUT,NOGO)
IS NOGO = 1 ?
YES
NO
(Record 2, x axis)
CALL OUTPT(IUNIT,LL,X,NOGO)
IS NOGO = 1 ?
YES
NO
(Record 3, y axis)
CALL OUTPT(IUNIT,JL,Y,NOGO)
IS NOGO = 1 ?
YES
NO
IS ISKIP(3) ≠ 1 ?
YES
NO
(Record 4, terrain array)
CALL OUTPT(IUNIT,LJDIM,HOQ,NOGO)


YES
(Calculate initial values of wind and pressure. Whenever possible, the one-dimensional arrays ULQ, VLQ, PLQ and HGQ are used instead of the three-dimensional arrays UL, VL, PL and the two-dimensional array HH. This is done to minimize assembled instructions and time of execution.)
(Test for terrain penetration of layer)
YES


DØ 200 J=2,JLM
DELYJ(J) = 1.0/(Y(J+1)-Y(J-1))
DYPJ(J) = 1.0/(Y(J+1)-Y(J))
200 CONTINUE
IS J ≥ JLM ?
NØ
YES
J=J+1
(Calculate the initial time increment DT.)
XMIN = 1.0E5
XMAX = -1.0E5
DØ 220 I=1,IJDIM
PKR = 1.0/PLQ(I)
CHK = SQRT((ULQ(I)*PKR)**2+(VLQ(I)*PKR)**2)+SQRT(GI*PLQ(I))
IS CHK > XMAX ?
YES
XMAX=CHK
NØ
220 CONTINUE
IS I ≥ IJDIM ?
NØ
YES
I=I+1
DØ 240 I=1,LLM
CHK = X(I+1)-X(I)
IS CHK < XMIN ?
YES
XMIN=CHK
NØ
240 CONTINUE
IS I ≥ LLM ?
NØ
YES
I=I+1


DT = DTLIMA*DXMIN/XMAX
IS JL > 3 ?
YES
DT=DT*SQ2I
NO
(Output the initial input parameters from the Namelist QLSTI.)
IS ISKIP(1) = 0 ?
YES
NO
(Output the initial wind field, layer height and terrain data.)
(Initialize constants for time loop.)
ICNT = 0
TIM = 0
A9 = DT*DT*0.5
C2 = 0.5*C1
IBL2 = 0
IS KDIM > 2 ?
YES
IBL2=IJDIM
NO
IJDIMP = 1-IBL2
IJDIMM = -1-IBL2
ISM = 0
N = 0
(Start time loop.)
N = N+1
(Time step counter)
IS ISM ≥ ISMSTH ?
(Reinitialize smoothing counter)
YES
ISM=0
NO
ICNT = ICNT+1
(Counter for recalculating DT)
IS ICNT < NCNT ?
YES
NO


XMAX = -1.0E3
(Recalculate DT, time step increment.)
DO 420 I=1,IJDIM
PKR = 1.0/PLQ(I)
CHK = SQRT((ULQ(I)*PKR)**2+(VLQ(I)*PKR)**2)+SQRT(G1*PLQ(I))
IS CHK > XMAX ?
YES
XMAX=CHK
NO
420 CONTINUE
IS I ≥ IJDIM ?
NO
I=I+1
YES
DT = DTLMDA*XMIN/XMAX
IS JL > 3 ?
YES
DT=DT*SQ21
NO
A9 = DT*DT*0.5
(Accumulate time.)
TIM = TIM+DT
IS IFLAG > 0 ?
YES
(Solution unstable)
NO
(Evaluate UL, VL and PL at each grid coordinate for this time step.)
DO 500 J=2,JLM


Calculate relative indices for the use of one-dimensional array rather than three-dimensional arrays and store parameters that are constant for the J dimension.
JP12 = J*IDIM+1+IBL2
JM12 = JP12-IPIDIM
J12 = JP12-IDIM
J13 = IJDIM+J12
DELY = DELYJ(J)
DYP = DYPJ(J)
DYM = DYPJ(J-1)
DO 500 I=2,LLM
JP12 = JP12+1
JM12 = JM12+1
J12 = J12+1
J13 = J13+1
(UL(I,J,1) is equivalent to ULQ(J12) and
UL(I,J,2) = ULQ(J13)
UL(I+1,J,1) = ULQ(J12+1)
UL(I,J+1,J) = ULQ(JP12))
PLB = PLQ(J12)
IS IFLAG > 0 ?
YES
NO
IS PLB > 20000 ?
YES
NO
IFLAG = N
(The following equations do not reflect the form of the model equations due to alterations for calculation efficiency. Parts of the equations have been separated to eliminate redundant calculations and divisions, multiplications and array indexing have been minimized.)
ULB = ULQ(J12)
VLB = VLQ(J12)
ULXP = ULQ(J12+1)
VLXP = VLQ(J12+1)
PLXP = PLQ(J12+1)
ULXM = ULQ(J12-1)
VLXM = VLQ(J12-1)
PLXM = PLQ(J12-1)
ULYP = ULQ(JP12)
VLYP = VLQ(JP12)
PLYP = PLQ(JP12)
ULYM = ULQ(JM12)
VLYM = VLQ(JM12)
PLYM = PLQ(JM12)
ULXYP = ULQ(JP12+1)
VLXYP = VLQ(JP12+1)
PLXYP = PLQ(JP12+1)

```
ULXYM = ULQ(JM12-1)
VLXYM = VLQ(JM12-1)
PLXYM = PLQ(JM12-1)
ULXMYP = ULQ(JP12-1)
VLXMYP = VLQ(JP12-1)
PLXMYP = PLQ(JP12-1)
ULXPYM = ULQ(JM12+1)
VLXPYM = VLQ(JM12+1)
PLXPYM = PLQ(JM12+1)
PLBI = 1.0/PLB
PLXPI = 1.0/PLXP
PLXMI = 1.0/PLXM
PLYPI = 1.0/PLYP
PLYMI = 1.0/PLYM
PLXYPI = 1.0/PLXYP
PLXYMI = 1.0/PLXYM
PXMYPI = 1.0/PLXMYP
PXPYMI = 1.0/PLXPYM

A39 = HGQ(J12-1BL2)
A43 = HGQ(JP12-1BL2)
A79 = HGQ(JM12-1BL2)
A21 = HGQ(J12+1JDIMP)
A75 = HGQ(JP12+1JDIMP)
A76 = HGQ(JM12+1JDIMP)
A77 = HGQ(JP12+1JDIMM)
A78 = HGQ(J12+1JDIMM)
A80 = HGQ(JM12+1JDIMM)
A1 = 2.0*DELXI(I)
A2 = 2.0*DELY
A10 = ULXP*PLXPI
A12 = ULXP*A10
A11 = ULB*PLBI
A14 = ULB*A11
A3 = PLXP*PLXP
A16 = PLB*PLB
A56 = 0.5*DELY
A46 = ULXYP*PLXYPI
A17 = A46*VLXYP
A51 = ULXPYM*PXPYMI
A18 = A51*VLXPYM
A49 = ULYP*PLYPI
A19 = A49*VLYP
A53 = ULYM*PLYMI
A20 = A53*VLYM
A6 = A19-A20
A33 = (PLXP+PLB)*G2
A22 = A21-A39
```

(Part of second-order terms common to UL, VL and PL)

FP = DXPI(I)*((A12-A14+G2*(A3-A16))+A33*A22)+A56*(A17-A18+A6)

= (f^+) Equation (4-20) in Section 4.

```
A8 = ULXM*PLXMI
A28 = ULXM*A8
A29 = PLXM*PLXM
A47 = ULXMYP*PXMYPI
A30 = A47*VLXMYP
A52 = ULXYM*PLXYMI
A31 = A52*VLXYM
A40 = (PLB+PLXM)*G2
```

(Part of second-order terms common to UL, VL and PL)

FM = DXPI(I-1)*((A14-A28+G2*(A16-A29))+A40*(A39-A78))+A56*(A6+A30-A31)

= (f^-) Equation (4-20) in Section 4.

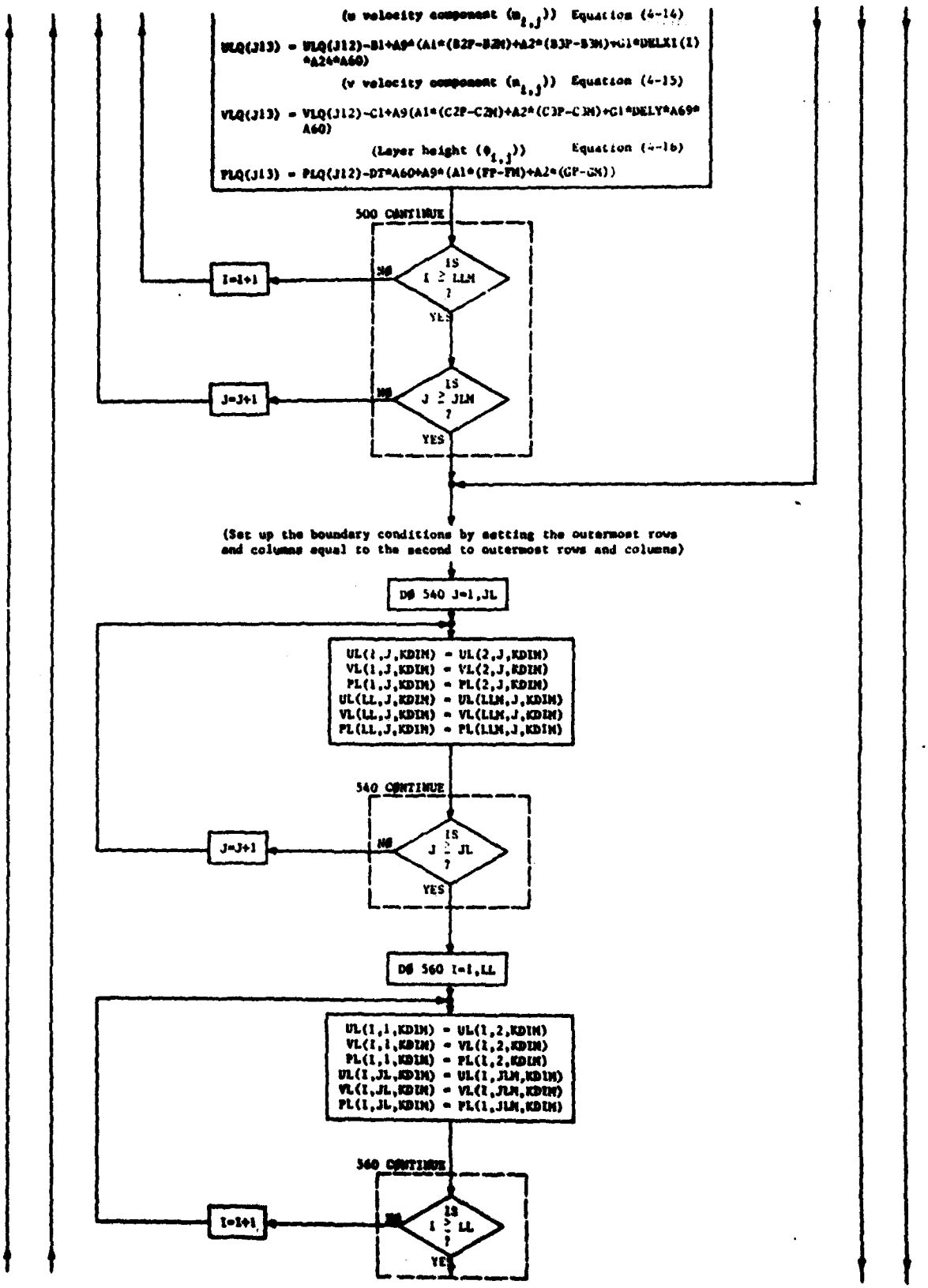
```
A54 = 0.5*DELXI(I)
A34 = A10*VLXP
A35 = A8*VLXM
A25 = A34-A35
A7 = VLYP*PLYPI
A36 = VLYP*A7
A45 = VLB*PLBI
A37 = A45*VLB
A38 = PLYP*PLYP
A65 = G2*(PLYP+PLB)
```

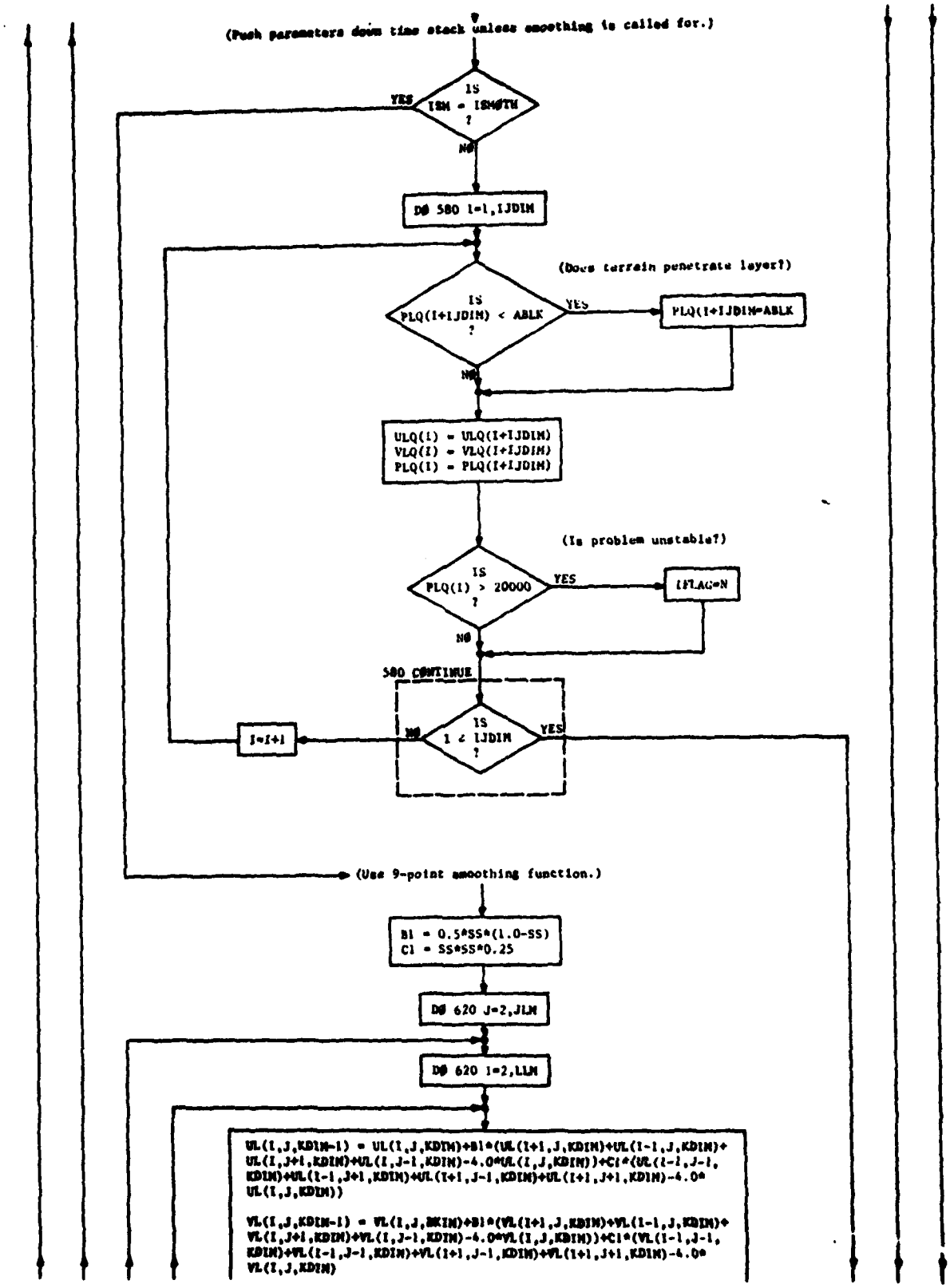
(Part of second-order terms common to UL, VL and PL)

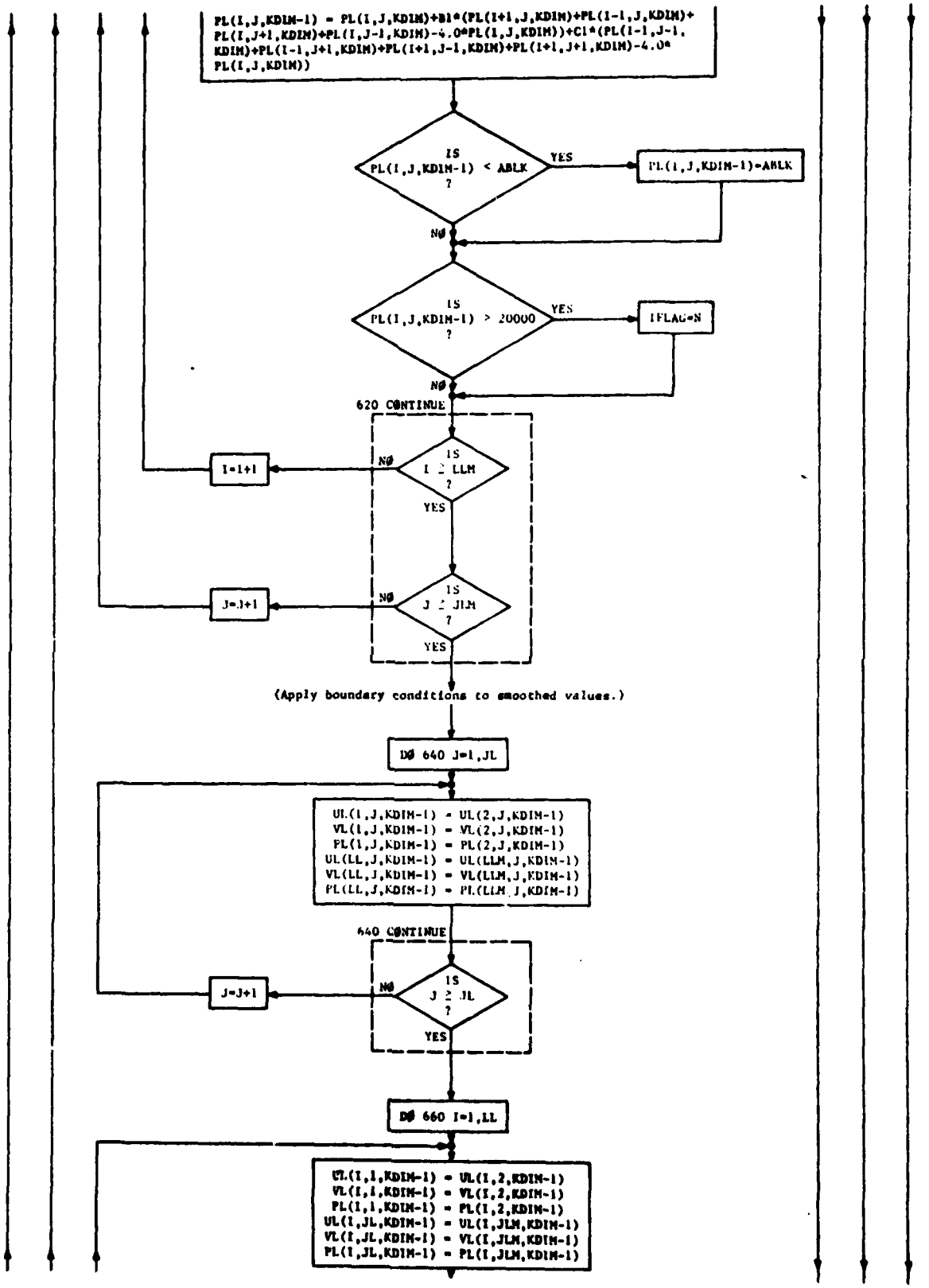
GP = A54*(A17-A30+A25)+DYP*((A36-A37+G2*(A38-A16))+A65*(A43-A39))

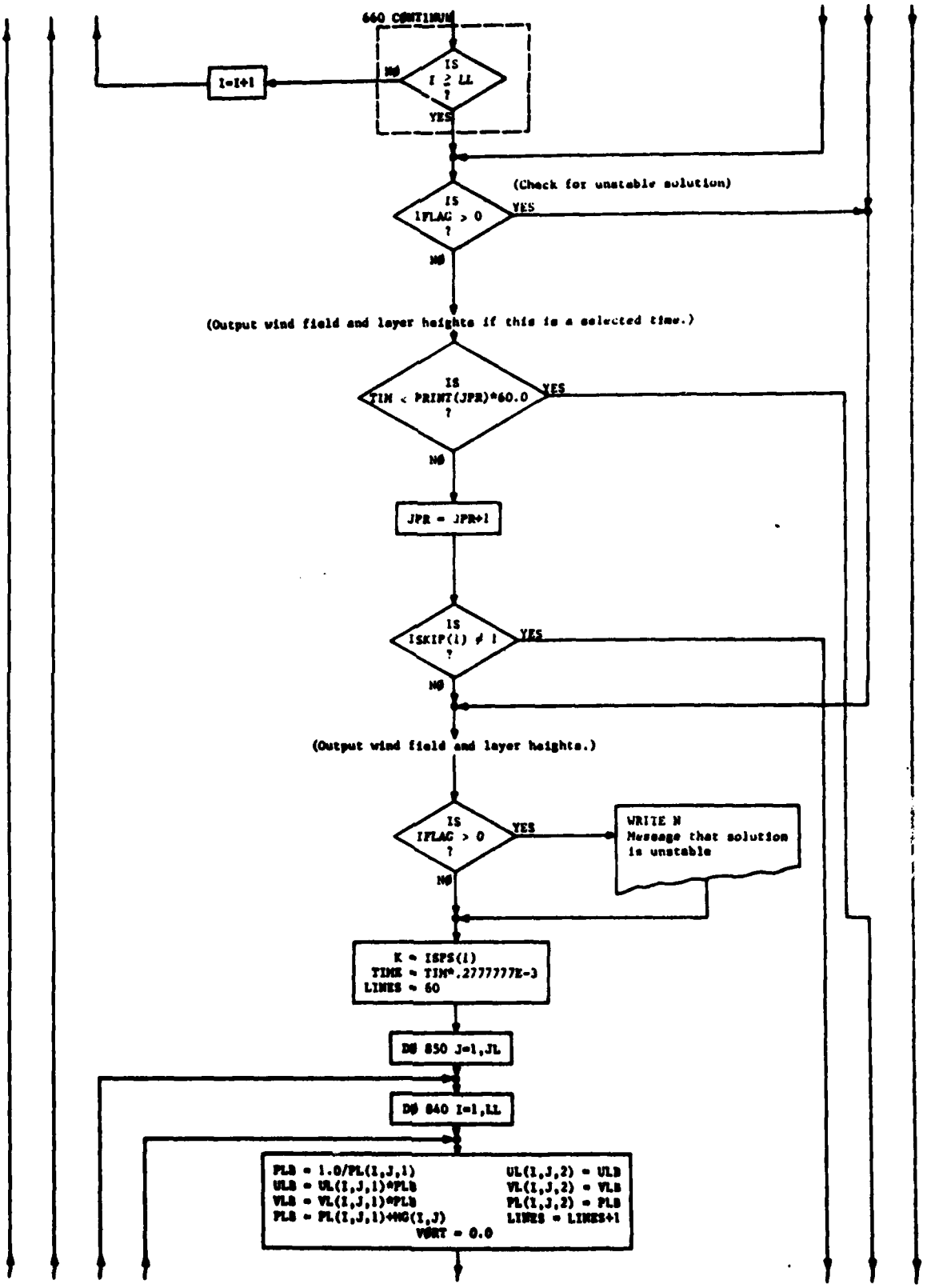
= (g^+) Equation (4-21) in Section 4.

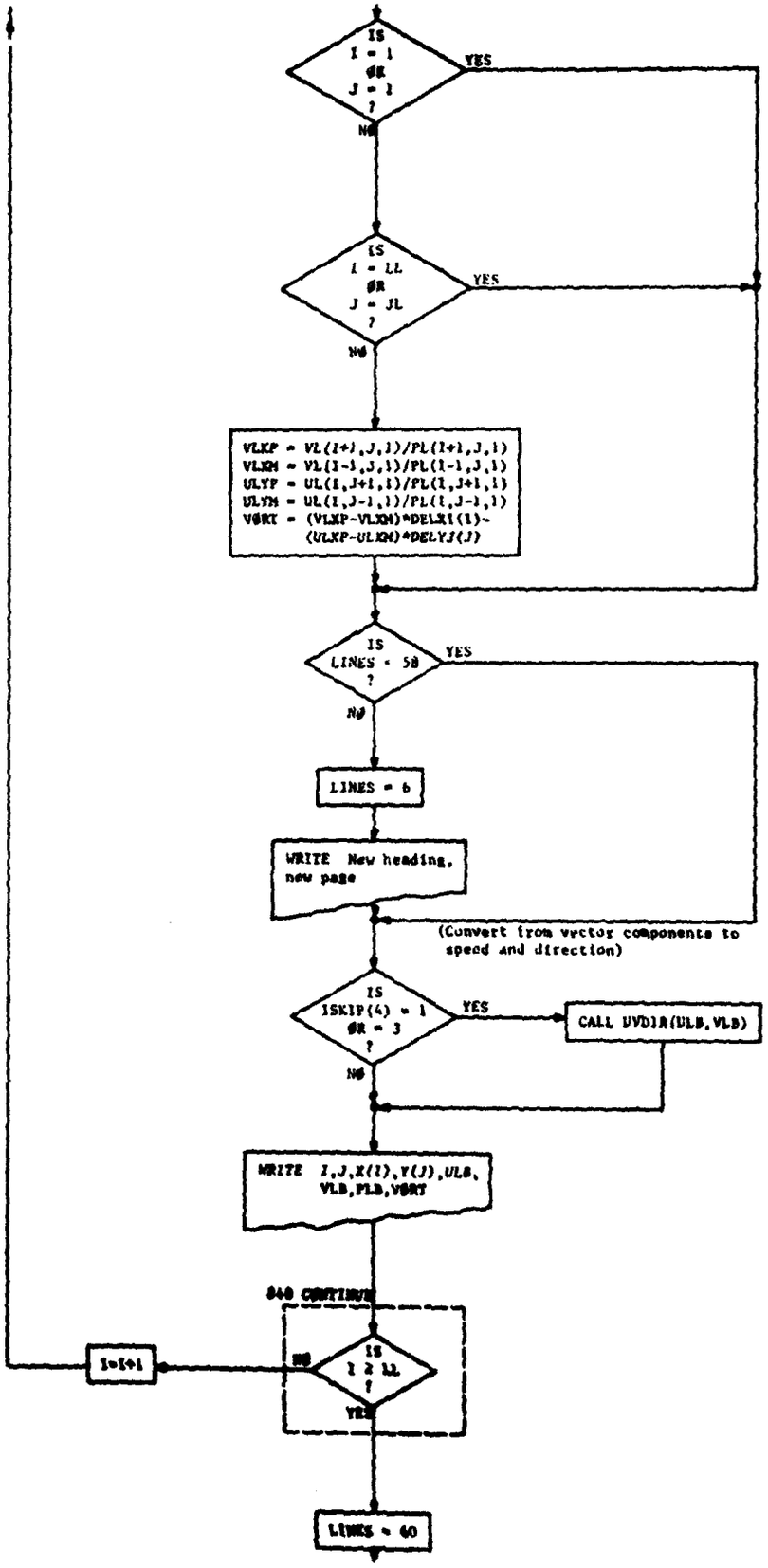
```
A50 = VLXM*PLYMI
A61 = VLXM*A50
A42 = PLYM*PLYM
A23 = G2*(PLB+PLYM)

(Part of second-order term common to UL, VL and PL)

GM = A54*(A25+A18-A31)+DYM*((A37-A41+G2*(A16-A42))+A23*
     (A39-A79)) = (g⁻) Equation (4-21) in Section 4.

A55 = A54+A54
 A5 = A12-A28
A30 = A3-A29
A57 = A56+A56
A26 = G2*PLB
A24 = A21-A78

(First-order term of u component Equation (4-14))

B1 = DT*(A55*(A5+G2*A58)+A57*A6+A26*A1*A24)

A71 = VLXYP-VLXIYM
A59 = VLYP-VLYM
 A4 = A14*PLB1
A13 = (ULXP-ULB)*DXPI(I)+A56*
      (A71+A59)

(Part of second-order term of u component, Equation (4-17))

B2P = (A10+A11)*FP+A13*(A33-0.5*(A12*PLXPI+A4))

A72 = VLXMYP-VLXYM
A44 = (ULB-ULXM)*DXPI(I-1)+
      A56*(A59+A72)

(Part of second-order term of u component, Equation (4-17))

B2M = (A11+A8)*FM+A44*(A40-0.5*(A4+A8*A8))

A27 = PLXYP*PLXYP
A62 = PLXMYP*PLXMYP
A48 = A11*VLB
A73 = ULXYP-ULXMYP
A67 = ULXP-ULXM
A15 = (VLYP-VLB)*DYP+A54*(A73+A67)

(Part of second-order term of u component, Equation (4-17))

B3P = 0.5*((A7+A45)*(A54*(A46*ULXYP-A47*ULXMYP+A54*G2*(A27-
      A62+A58))+DYP*(A19-A48)+A65*A54*(A75-A77+A24))+(A69+
      A11)*GP-(A19*PLYPI+A48*PLBI)*A15)

A61 = PLXPYM*PLXPYM
A63 = PLXYM*PLXYM
A64 = A48*PLBI
A74 = ULXPYM-ULXYM
A32 = DYM*(VLB-VLYM)+A54*
      (A67+A74)

(Part of second-order term of u component, Equation (4-17))

B3M = 0.5*((A45+A50)*(A54*(A5+A51*ULXPYM-A52*ULXYM+G2*(A58+
      A61-A63))+DYM*(A48-A20)+A23*A34*(A24+A76-A80))+(A11+A53)
      *GM-(A64+A20*PLYMI)*A32)

A70 = A36-A41
A68 = A36-A42
A69 = A43-A79

(First-order term of v component, Equation (4-15))

C1 = DT*(A55*A25+A57*(A70+G2*A68)+A26*A2*A69

(Part of second-order term of v component, Equation (4-18))

C2P = 0.5*((VLXP*PLXPI+A45)*FP+(A10+A11)*(DXPI(I)*(A34-A48)+
      A56*(VLXYP*VLXYP*PLXYP1-VLXPYM*VLXPYM*PXPYM(I+A70+G2*
      (A27-A61+A68))+A33*A56*(A75-A76+A69))-(A34*PLXPI+A44)
      *A13)

(Part of second-order term of v component, Equation (4-18))

C2M = 0.5*((A45+VLXM*PLXMI)*FM+(A11+A8)*(DXPI(I-1)*(A48-A8*
      VLXM)+A56*(A70+VLXMYP*VLXMYP*PXMYP1-VLXYM*VLXYM*PLXYM(I+
      G2*(A68+A62-A63))+A40*A56*(A69+A77-A80))-(A64+A35*PLXMI)
      *A44)
                A66 = A45*A45

(Part of second-order term of v component, Equation (4-18))

C3P = (A7+A43)*GP+A15*(A65-0.5*(A7*A7+A66))

(Part of second order term of v component, Equation (4-18))

C3M = (A45+A50)*GM+A32*(A23-0.5*(A66+A30*A30))

A60 = A55*A67+A57*A59
```

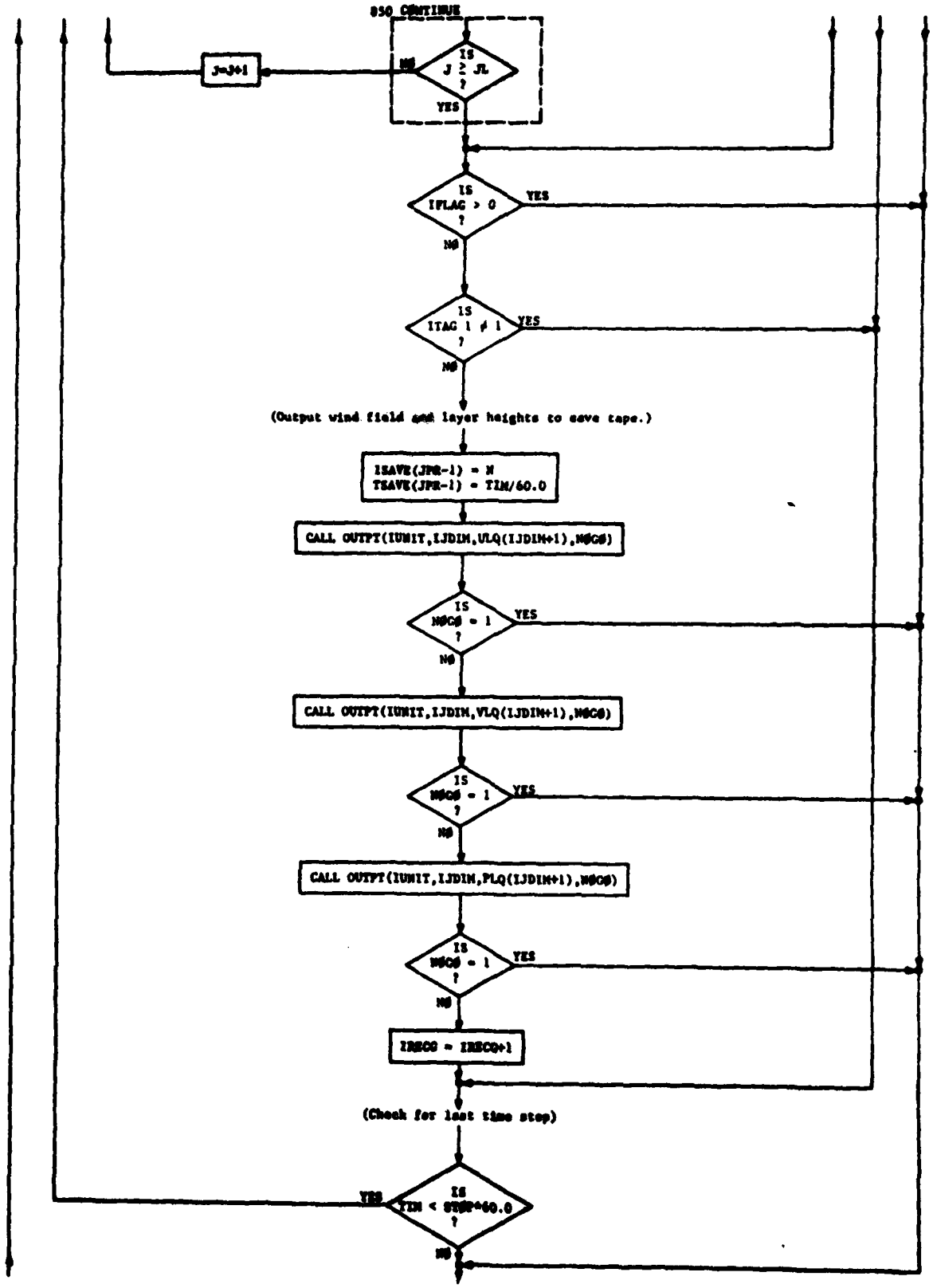

(u velocity component ($u_{i,j}$)) Equation (4-14)
ULQ(J13) = ULQ(J12)-B1*A9*(A1*(B2P-B2M)+A2*(B3P-B3M)+G1*DELX1(I)*A24*A60)
(v velocity component ($v_{i,j}$)) Equation (4-15)
VLQ(J13) = VLQ(J12)-C1*A9(A1*(C2P-C2M)+A2*(C3P-C3M)+G1*DELY*A69*A60)
(Layer height ($\phi_{i,j}$)) Equation (4-16)
PLQ(J13) = PLQ(J12)-DT*A60+A9*(A1*(FP-FM)+A2*(GP-GM))
500 CONTINUE
IS I ≥ LLM ?
NO
I=I+1
YES
IS J ≥ JLM ?
NO
J=J+1
YES
(Set up the boundary conditions by setting the outermost rows and columns equal to the second to outermost rows and columns)
DO 540 J=1,JL
UL(1,J,KDIM) = UL(2,J,KDIM)
VL(1,J,KDIM) = VL(2,J,KDIM)
PL(1,J,KDIM) = PL(2,J,KDIM)
UL(LL,J,KDIM) = UL(LLM,J,KDIM)
VL(LL,J,KDIM) = VL(LLM,J,KDIM)
PL(LL,J,KDIM) = PL(LLM,J,KDIM)
540 CONTINUE
IS J ≥ JL ?
NO
J=J+1
YES
DO 560 I=1,LL
UL(I,1,KDIM) = UL(I,2,KDIM)
VL(I,1,KDIM) = VL(I,2,KDIM)
PL(I,1,KDIM) = PL(I,2,KDIM)
UL(I,JL,KDIM) = UL(I,JLM,KDIM)
VL(I,JL,KDIM) = VL(I,JLM,KDIM)
PL(I,JL,KDIM) = PL(I,JLM,KDIM)
560 CONTINUE
IS I ≥ LL ?
NO
I=I+1
YES

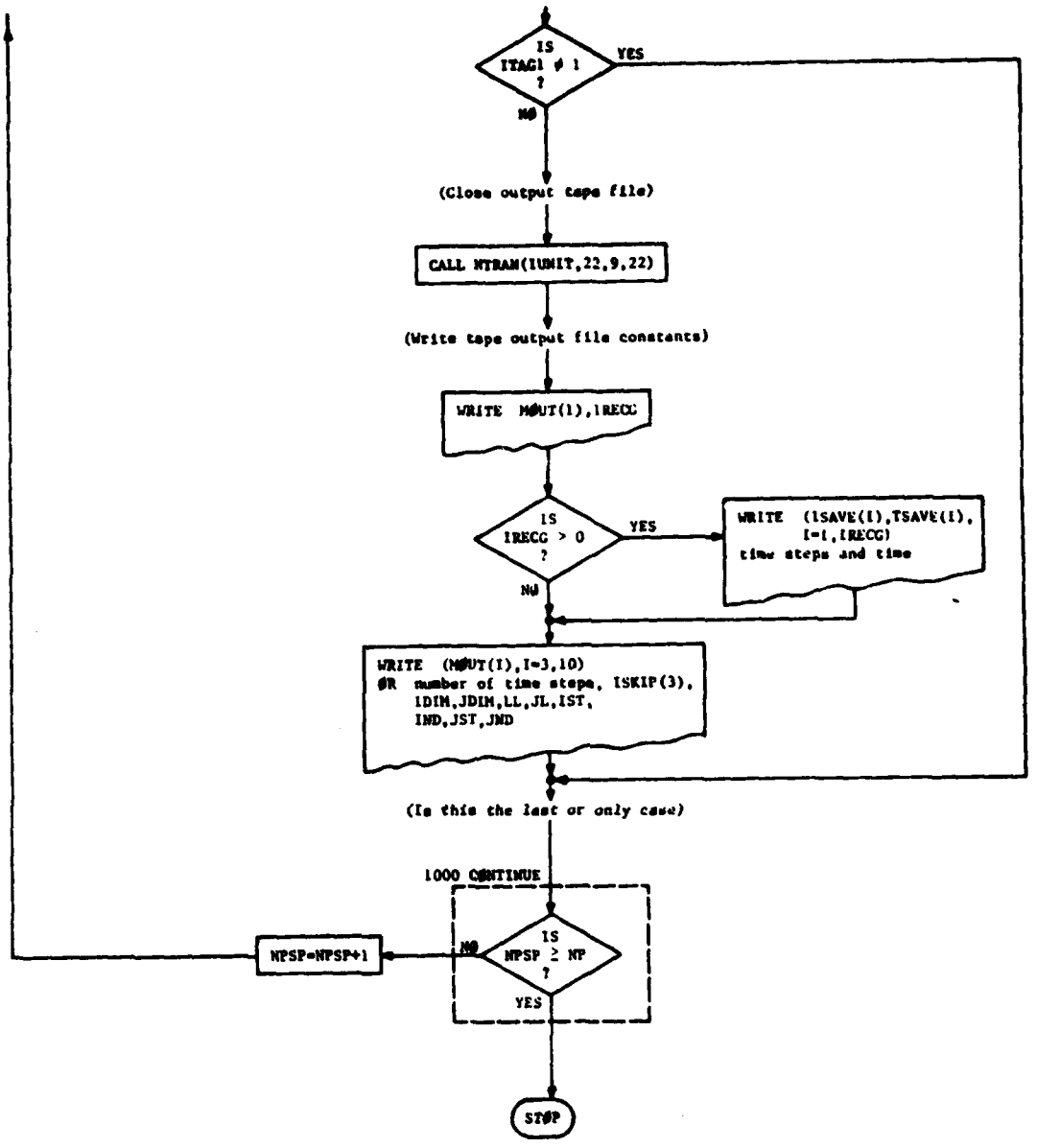

(Push parameters down time stack unless smoothing is called for.)
IS ISM = ISMOTH ?
YES
NO
DO 580 I=1,IJDIM
(Does terrain penetrate layer?)
IS PLQ(I+IJDIM) < ABLK ?
YES
PLQ(I+IJDIM=ABLK
NO
ULQ(I) = ULQ(I+IJDIM)
VLQ(I) = VLQ(I+IJDIM)
PLQ(I) = PLQ(I+IJDIM)
(Is problem unstable?)
IS PLQ(I) > 20000 ?
YES
IFLAG=N
NO
580 CONTINUE
IS I < IJDIM ?
NO
YES
I=I+1
(Use 9-point smoothing function.)
B1 = 0.5*SS*(1.0-SS)
C1 = SS*SS*0.25
DO 620 J=2,JLM
DO 620 I=2,LLM
UL(I,J,KDIM-1) = UL(I,J,KDIM)+B1*(UL(I+1,J,KDIM)+UL(I-1,J,KDIM)+ UL(I,J+1,KDIM)+UL(I,J-1,KDIM)-4.0*UL(I,J,KDIM))+C1*(UL(I-1,J-1, KDIM)+UL(I-1,J+1,KDIM)+UL(I+1,J-1,KDIM)+UL(I+1,J+1,KDIM)-4.0* UL(I,J,KDIM))
VL(I,J,KDIM-1) = VL(I,J,KDIM)+B1*(VL(I+1,J,KDIM)+VL(I-1,J,KDIM)+ VL(I,J+1,KDIM)+VL(I,J-1,KDIM)-4.0*VL(I,J,KDIM))+C1*(VL(I-1,J-1, KDIM)+VL(I-1,J-1,KDIM)+VL(I+1,J-1,KDIM)+VL(I+1,J+1,KDIM)-4.0* VL(I,J,KDIM)


PL(I,J,KDIM-1) = PL(I,J,KDIM)+B1*(PL(I+1,J,KDIM)+PL(I-1,J,KDIM)+ PL(I,J+1,KDIM)+PL(I,J-1,KDIM)-4.0*PL(I,J,KDIM))+C1*(PL(I-1,J-1, KDIM)+PL(I-1,J+1,KDIM)+PL(I+1,J-1,KDIM)+PL(I+1,J+1,KDIM)-4.0* PL(I,J,KDIM))
IS PL(I,J,KDIM-1) < ABLK ?
YES
PL(I,J,KDIM-1)=ABLK
NØ
IS PL(I,J,KDIM-1) > 20000 ?
YES
IFLAG=N
NØ
620 CONTINUE
IS I ≥ LLM ?
NØ
I=I+1
YES
IS J ≥ JLM ?
NØ
J=J+1
YES
(Apply boundary conditions to smoothed values.)
DØ 640 J=1,JL
UL(1,J,KDIM-1) = UL(2,J,KDIM-1)
VL(1,J,KDIM-1) = VL(2,J,KDIM-1)
PL(1,J,KDIM-1) = PL(2,J,KDIM-1)
UL(LL,J,KDIM-1) = UL(LLM,J,KDIM-1)
VL(LL,J,KDIM-1) = VL(LLM,J,KDIM-1)
PL(LL,J,KDIM-1) = PL(LLM,J,KDIM-1)
640 CONTINUE
IS J ≥ JL ?
NØ
J=J+1
YES
DØ 660 I=1,LL
UL(I,1,KDIM-1) = UL(I,2,KDIM-1)
VL(I,1,KDIM-1) = VL(I,2,KDIM-1)
PL(I,1,KDIM-1) = PL(I,2,KDIM-1)
UL(I,JL,KDIM-1) = UL(I,JLM,KDIM-1)
VL(I,JL,KDIM-1) = VL(I,JLM,KDIM-1)
PL(I,JL,KDIM-1) = PL(I,JLM,KDIM-1)


640 CONTINUE
IS I ≥ LL ?
NO
YES
I=I+1
(Check for unstable solution)
IS IFLAG > 0 ?
YES
NO
(Output wind field and layer heights if this is a selected time.)
IS TIM < PRINT(JPR)*60.0 ?
YES
NO
JPR = JPR+1
IS ISKIP(1) ≠ 1 ?
YES
NO
(Output wind field and layer heights.)
IS IFLAG > 0 ?
YES
NO
WRITE N
Message that solution is unstable
K = ISPS(1)
TIME = TIM*.2777777E-3
LINES = 60
DO 850 J=1,JL
DO 840 I=1,LL
PLB = 1.0/PL(I,J,1)
ULB = UL(I,J,1)*PLB
VLB = VL(I,J,1)*PLB
PLB = PL(I,J,1)+HG(I,J)
VERT = 0.0
UL(I,J,2) = ULB
VL(I,J,2) = VLB
PL(I,J,2) = PLB
LINES = LINES+1

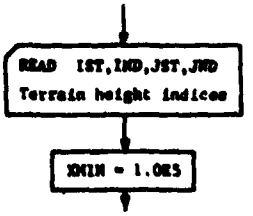

IS I = 1 ØR J = 1 ?
YES
NØ
IS I = LL ØR J = JL ?
YES
NØ
VLXP = VL(I+1,J,1)/PL(I+1,J,1)
VLXM = VL(I-1,J,1)/PL(I-1,J,1)
ULYP = UL(I,J+1,1)/PL(I,J+1,1)
ULYM = UL(I,J-1,1)/PL(I,J-1,1)
VØRT = (VLXP-VLXM)*DELX1(I)-
(ULXP-ULXM)*DELYJ(J)
IS LINES < 58 ?
YES
NØ
LINES = 6
WRITE New heading, new page
(Convert from vector components to speed and direction)
IS ISKIP(4) = 1 ØR = 3 ?
YES
CALL UVDIR(ULB,VLB)
NØ
WRITE I,J,X(I),Y(J),ULB, VLB,PLB,VØRT
840 CONTINUE
IS I ≥ LL ?
NØ
YES
I=I+1
LINES = 60

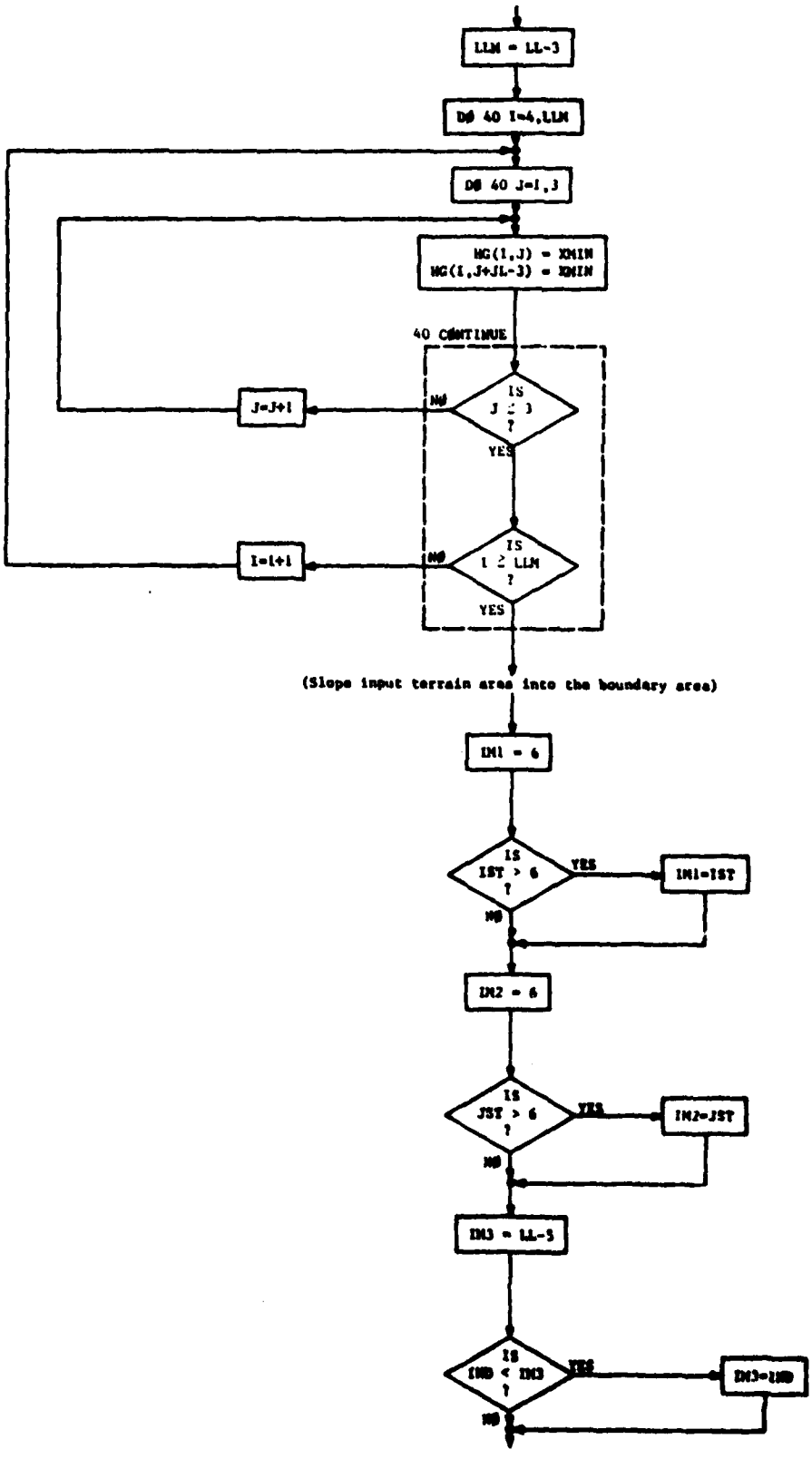

850 CONTINUE
IS J ≥ JL ?
NO
YES
J=J+1
IS IFLAG > 0 ?
YES
NO
IS ITAG 1 ≠ 1 ?
YES
NO
(Output wind field and layer heights to save tape.)
ISAVE(JPR-1) = N
TSAVE(JPR-1) = TIM/60.0
CALL OUTPT(IUNIT,IJDIM,ULQ(IJDIM+1),NOGO)
IS NOGO = 1 ?
YES
NO
CALL OUTPT(IUNIT,IJDIM,VLQ(IJDIM+1),NOGO)
IS NOGO = 1 ?
YES
NO
CALL OUTPT(IUNIT,IJDIM,PLQ(IJDIM+1),NOGO)
IS NOGO = 1 ?
YES
NO
IRECO = IRECO+1
(Check for last time step)
IS TIM < STOP*60.0 ?
YES
NO

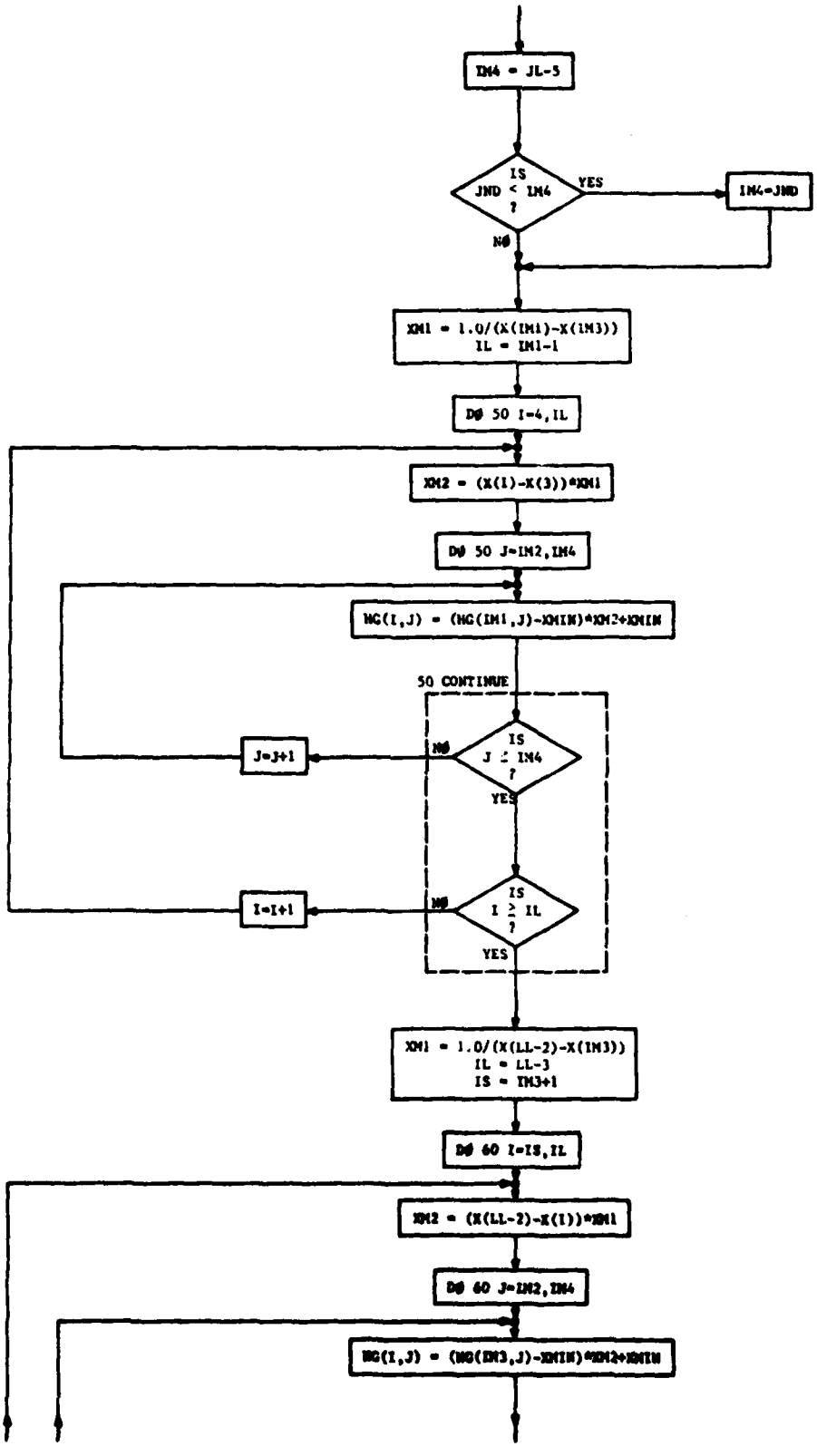


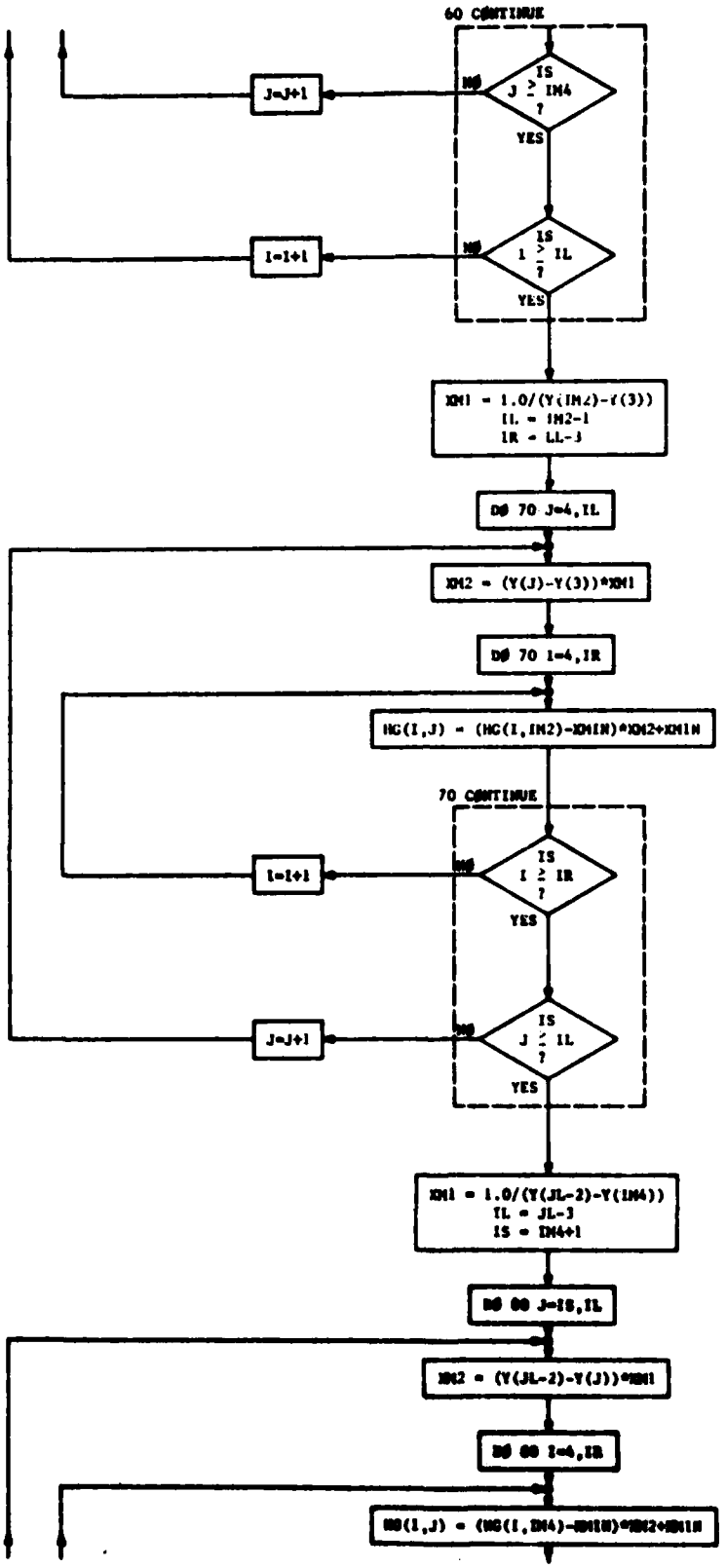
D.3 SUBROUTINE MØUTNR(NG,LL,JL,X,Y)

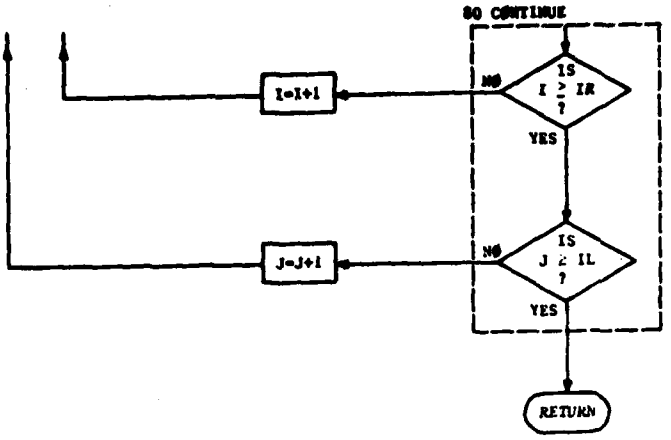
Subroutine MØUTNR reads the terrain data and the indices of the terrain data. The indices IST, IND, JST and JND of the starting and ending points on the x and y axes are input first. The terrain height data are then input. Areas of the grid that do not contain terrain height data and automatically the first (last) three rows and columns are filled by the program. These areas are filled with terrain heights that slope down to the minimum height at the boundary edges.




LLM = LL-3
DØ 40 I=4,LLM
DØ 40 J=1,3
MG(1,J) = XMIN
MG(I,J+JL-3) = XMIN
40 CONTINUE
IS J ≥ 3 ?
NØ
J=J+1
YES
IS I ≥ LLM ?
NØ
I=I+1
YES
(Slope input terrain area into the boundary area)
IM1 = 6
IS IST > 6 ?
YES
IM1=IST
NØ
IM2 = 6
IS JST > 6 ?
YES
IM2=JST
NØ
IM3 = LL-5
IS IMØ < IM3 ?
YES
IM3=IMØ
NØ

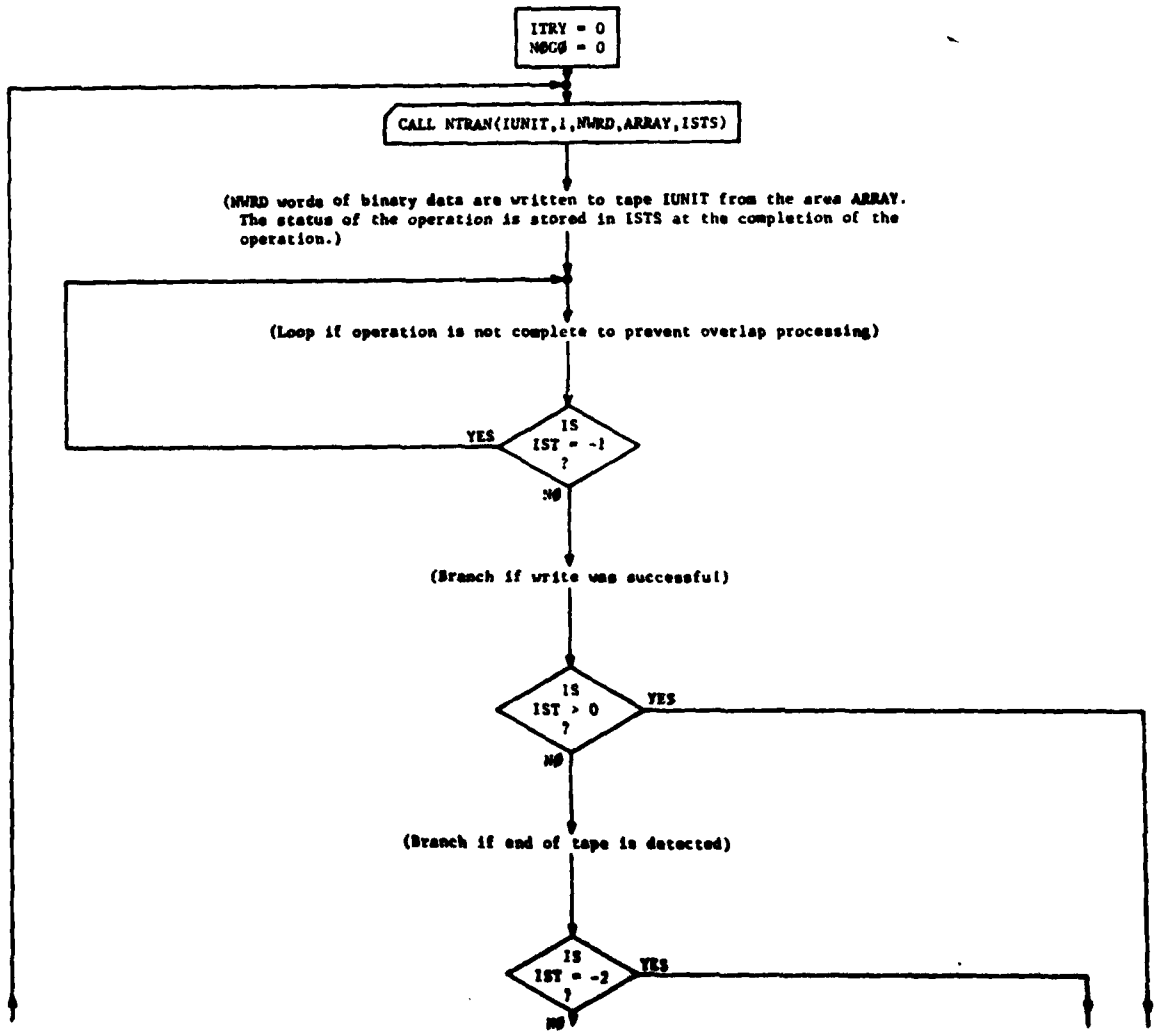

IM4 = JL-5
IS JND < IM4 ?
YES
NØ
IM4=JND
XM1 = 1.0/(X(IM1)-X(IM3))
IL = IM1-1
DØ 50 I=4,IL
XM2 = (X(I)-X(3))*XM1
DØ 50 J=IM2,IM4
HG(I,J) = (HG(IM1,J)-XMIN)*XM2+XMIN
50 CONTINUE
IS J ≥ IM4 ?
NØ
YES
J=J+1
IS I ≥ IL ?
NØ
YES
I=I+1
XM1 = 1.0/(X(LL-2)-X(IM3))
IL = LL-3
IS = IM3+1
DØ 60 I=IS,IL
XM2 = (X(LL-2)-X(I))*XM1
DØ 60 J=IM2,IM4
HG(I,J) = (HG(IM3,J)-XMIN)*XM2+XMIN

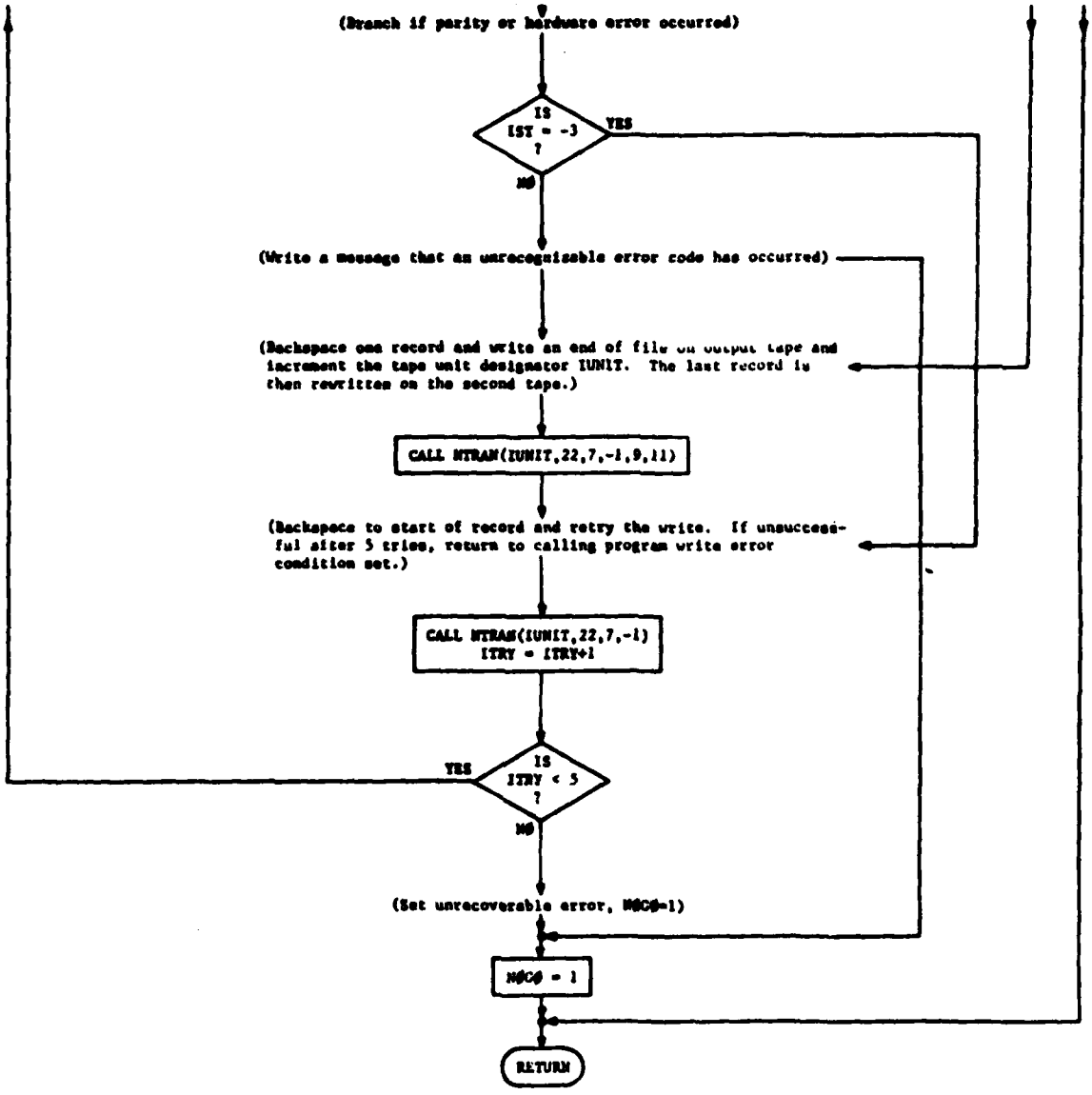

60 CONTINUE
IS J ≥ IM4 ?
NO
YES
J=J+1
IS I ≥ IL ?
NO
YES
I=I+1
XM1 = 1.0/(Y(IM2)-Y(3))
IL = IM2-1
IR = LL-3
DO 70 J=4,IL
XM2 = (Y(J)-Y(3))*XM1
DO 70 I=4,IR
HG(I,J) = (HG(I,IM2)-XM1N)*XM2+XM1N
70 CONTINUE
IS I ≥ IR ?
NO
YES
I=I+1
IS J ≥ IL ?
NO
YES
J=J+1
XM1 = 1.0/(Y(JL-2)-Y(IM4))
IL = JL-3
IS = IM4+1
DO 80 J=IS,IL
XM2 = (Y(JL-2)-Y(J))*XM1
DO 80 I=4,IR
HG(I,J) = (HG(I,IM4)-XM1N)*XM2+XM1N



D.4 SUBROUTINE ØUTPT(IUNIT,NWRD,ARRAY,NØCØ)

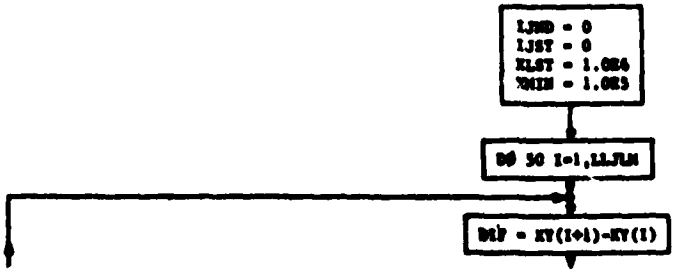
Subroutine ØUTPUT writes the wind field and layer height information to save tape. *This routine uses the* UNIVAC 1108 NTRAN subroutines for all output.

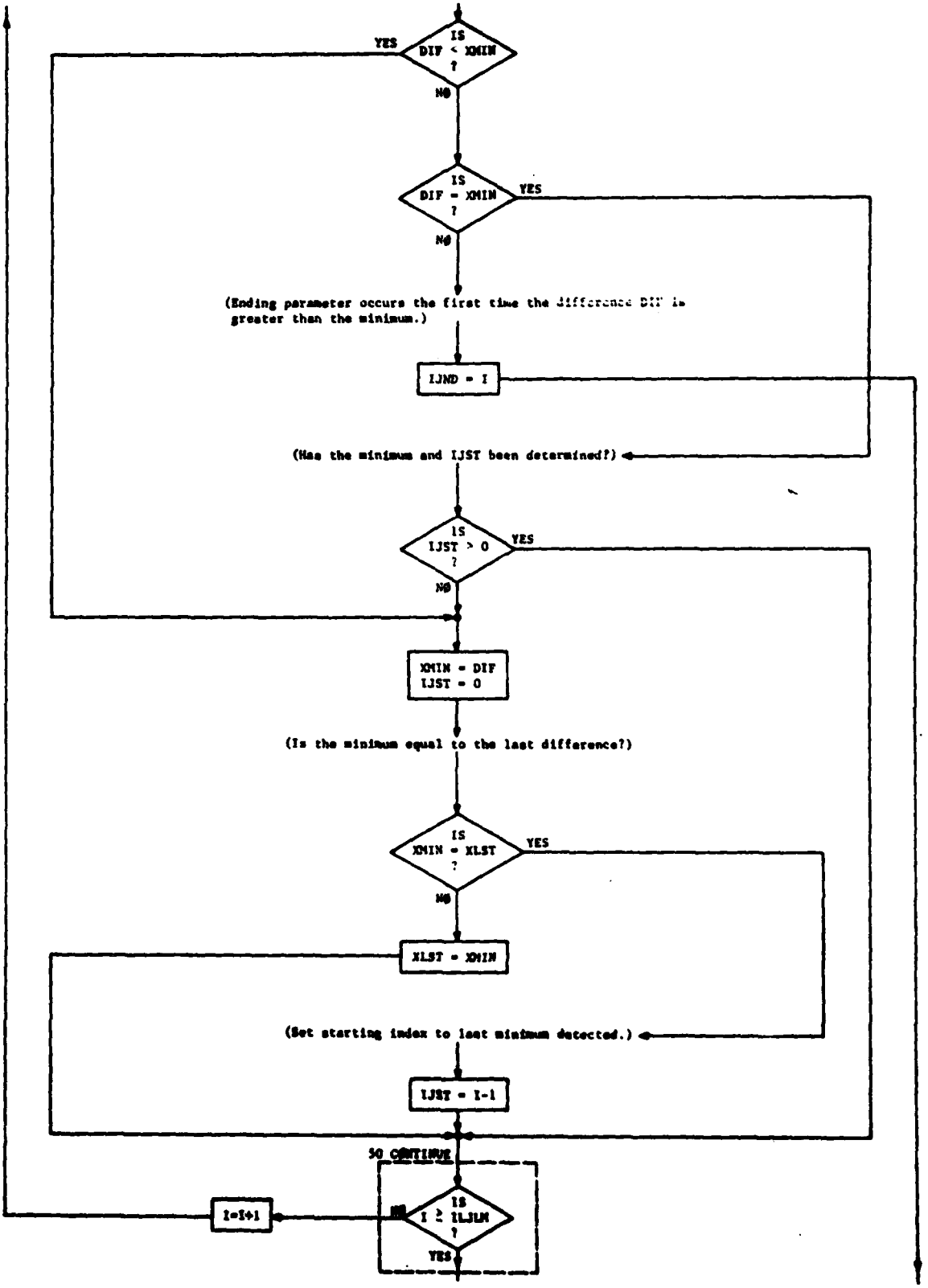


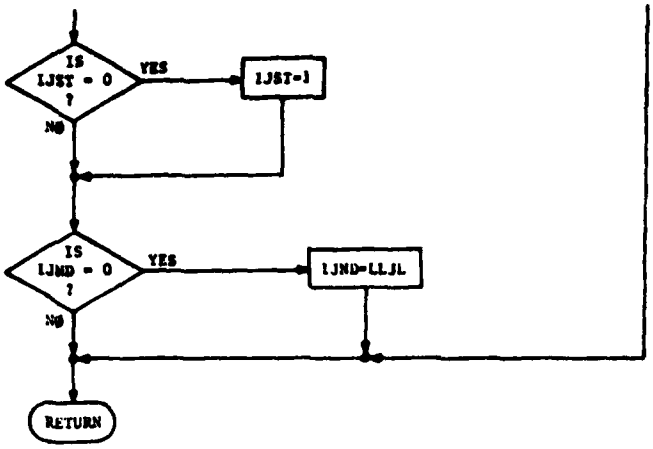


D.5 SUBROUTINE MISC(IJST,IJND,XY,LLJL,LLJM)

Subroutine MISC determines the starting and ending indices on the x or y axis that determines the area within the grid over which uniform grid spacing occurs. These parameters IJST and IJND for both axes are output to the save tape for plotting of the grid dependent parameters.

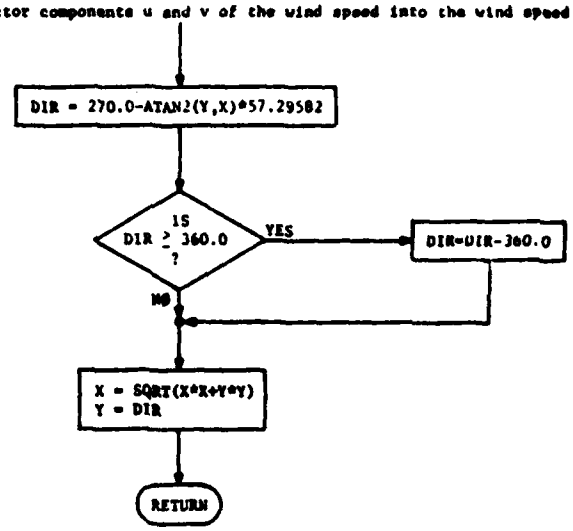



IS DIF < XMIN ?
YES
NO
IS DIF = XMIN ?
YES
NO
(Ending parameter occurs the first time the difference DIF is greater than the minimum.)
IJND = I
(Has the minimum and IJST been determined?)
IS IJST > 0 ?
YES
NO
XMIN = DIF
IJST = 0
(Is the minimum equal to the last difference?)
IS XMIN = XLST ?
YES
NO
XLST = XMIN
(Set starting index to last minimum detected.)
IJST = I-1
50 CONTINUE
IS I ≥ ILJM ?
NO
YES
I=I+1



D.6 SUBROUTINE UVDIR(X,Y)

Subroutine UVDIR converts the vector components u and v of the wind speed into the wind speed and direction.



Security Classification

DOCUMENT CONTROL DATA - R & D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY (Corporate author)
H. E. CRAMER COMPANY
P. O. Box 9249
Salt Lake City, Utah 84109

2a. REPORT SECURITY CLASSIFICATION
UNCLASSIFIED

2b. GROUP

3. REPORT TITLE
STUDY AND INVESTIGATION OF COMPUTER ALGORITHMS FOR THE SOLUTION OF THE SHALLOW-FLUID EQUATIONS AS A MEANS OF COMPUTING TERRAIN INFLUENCES ON WIND FIELDS

4. DESCRIPTIVE NOTES (Type of report and inclusive dates)
Technical Report

5. AUTHOR(S) (First name, middle initial, last name)
Arthur G. Tingle and Jay R. Bjorklund

6. REPORT DATE	7a. TOTAL NO. OF PAGES	7b. NO. OF REFS
July 1973	288 (2 volumes)	17

8a. CONTRACT OR GRANT NO.	9a. ORIGINATOR'S REPORT NUMBER(S)
Contract No. DAAD07-72-C-0309	TR-73-302-01
b. PROJECT NO.	
c. DA Task No. 1T161102B53A-17	9b. OTHER REPORT NO(S) (Any other numbers that may be assigned this report)
d.	

10. DISTRIBUTION STATEMENT
Approved for public release; distribution unlimited.

11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY
Contract Monitor: Dr. Joseph Shinn USAECOM, Atmospheric Sciences Laboratory White Sands Missile Range, NM 88002	US Army Electronics Command Fort Monmouth, New Jersey 07703

13. ABSTRACT

This report describes the development and documentation of a computer algorithm, containing a two-dimensional shallow-fluid model, for calculating the wind field above complex terrain. The optimum finite-differencing procedure employed for numerical solutions of the algorithm is a Lax-Wendroff scheme using the grid points and two time levels in combination with a nine-point low-pass filter.

A comprehensive computational program, using an isolated symmetrical mountain, was carried out to provide guidelines as to the nature of two-dimensional solutions of the shallow-fluid equations for the wide variety of initial conditions encountered in the atmosphere. The results showed that the flow patterns could be divided into four major categories: Subcritical without hydraulic jumps; supercritical without upstream waves; critical with hydraulic jumps and wind-direction reversals; critical with hydraulic jumps but without wind-direction reversals. For the subcritical and supercritical flows, initialization procedures do not appear to pose a problem. For the critical flows, care must be taken in the selection of initialization procedures.

Comparisons of calculated wind field patterns with recent detailed observations of wind circulations above complex terrain show excellent qualitative agreement in the limited cases available for analysis. Additionally, the computer algorithm for the two-dimensional model, when applied to the terrain at White Sands Missile Range, gave results that were consistent with the limited observations available for two example situations. The computer program containing the two-dimensional shallow-fluid model, written in Fortran V language and designed for use on a UNIVAC 1108 machine, is fully documented in the appendices to the report.

14. KEY WORDS	LINK A		LINK B		LINK C	
	ROLE	WT	ROLE	WT	ROLE	WT
1. Mesoscale Model						
2. Shallow-Water Equations						
3. Wind Flow						
4. Complex Terrain						
5. Computer Calculations						


7-8
DTIC